P32/42 CHASSIS

BODY BUILDERS INSTRUCTIONS

The Incomplete Vehicle Document (IVD) is supplied with each incomplete vehicle, and provides information that should be used by intermediate and final stage manufacturers in determining conformity to applicable Federal Motor Vehicle Safety Standards (FMVSS). The IVD also includes information which must be followed in order to ensure that Environmental Protection Agency (EPA) and California emissions certification requirements and NHTSA Fuel Regulations are met.

The Body Builders Book contains information that may be used in addition to the IVD for any manufacturer making alterations to an complete/incomplete vehicle. No alteration should be made to the incomplete vehicle which either directly or indirectly results in any component, assembly or system being in nonconformance with any applicable Federal Motor Vehicle Safety Standard or Emission Regulation. Intermediate and final stage manufacturers should be familiar with all Federal Motor Vehicle Safety Standards and Emission Regulations and aware of their specific responsibilities as manufacturers.

For further assistance contact SVIE at: 1 (800) 875-4742

All notes are applicable to all models except where specifically stated otherwise.

Section 0 – General Instructions

Check for proper clearance between body members and chassis components which may in any way affect the reliability and performance of the vehicle by developing abrasion and wear points from moving parts or degradation from extreme environment or thermal exposure or may increase interior noise. Any attachments must consider chassis components for jounce and rebound motion at Maximum GVW.

Check headlamp aim and all vehicle illumination systems for proper operation when the vehicle has been completed. Re-aim headlamps when necessary. Check for proper operation of windshield washer, wipers and defroster system.

Extreme care must be taken when working on vehicles equipped with Engine Control Module (ECM), Powertrain Control Module (PCM), Transmission Control Module (TCM), Vehicle Control Module (VCM), Anti-lock Braking System Model (ABS) or any electronic unit associated with an inflatable restraint system. (See Owner's Manual).

If arc-welding is employed on the chassis, precautions must be taken to protect all vehicle components, especially brake, fuel lines, front suspension air cylinders and fuel tank assembly, electrical wiring and ECM/PCM/TCM, VCM or ABS. To avoid electronic component damage, disconnect battery (batteries); disconnect the negative cable first, followed by the positive. To reconnect cables; connect the positive first, then the negative.

All labels on the vehicle (any message applied to the vehicle or vehicle component that informs, instructs, or warns) must appear on the completed vehicle so the user can read them easily and without obstruction.

Service and service replacement parts for your add-on systems may not be available from a GM dealer. Those installing aftermarket systems should provide information as to where and how to obtain service.

Section 1 – Body

Accessory items such as refrigerator, hot water heater, furnace, etc., which operate on liquid propane gas should be located and protected to prevent exposure to any flame.

Body structures, interior and accessory arrangements must be designed into the vehicle to provide for proper load capacity and distribution on both axles and not to exceed any gross axle weight ratings. Lateral load equalization must also be maintained. The resultant Center of Gravity of the unladen vehicle must be within the limits tabulated in the FMVSS 105 section of the Incomplete Vehicle Document.

Body insulation provided by General Motors should not be removed. This includes any thermal or underbody heat shields. This insulation is provided to protect the vehicle body and occupants from excessive heat and/or provide noise attenuation. Any replacement material internal to the occupant compartment must be certified for MVSS standard on flammability. Areas of specific concern, but not limited to are:

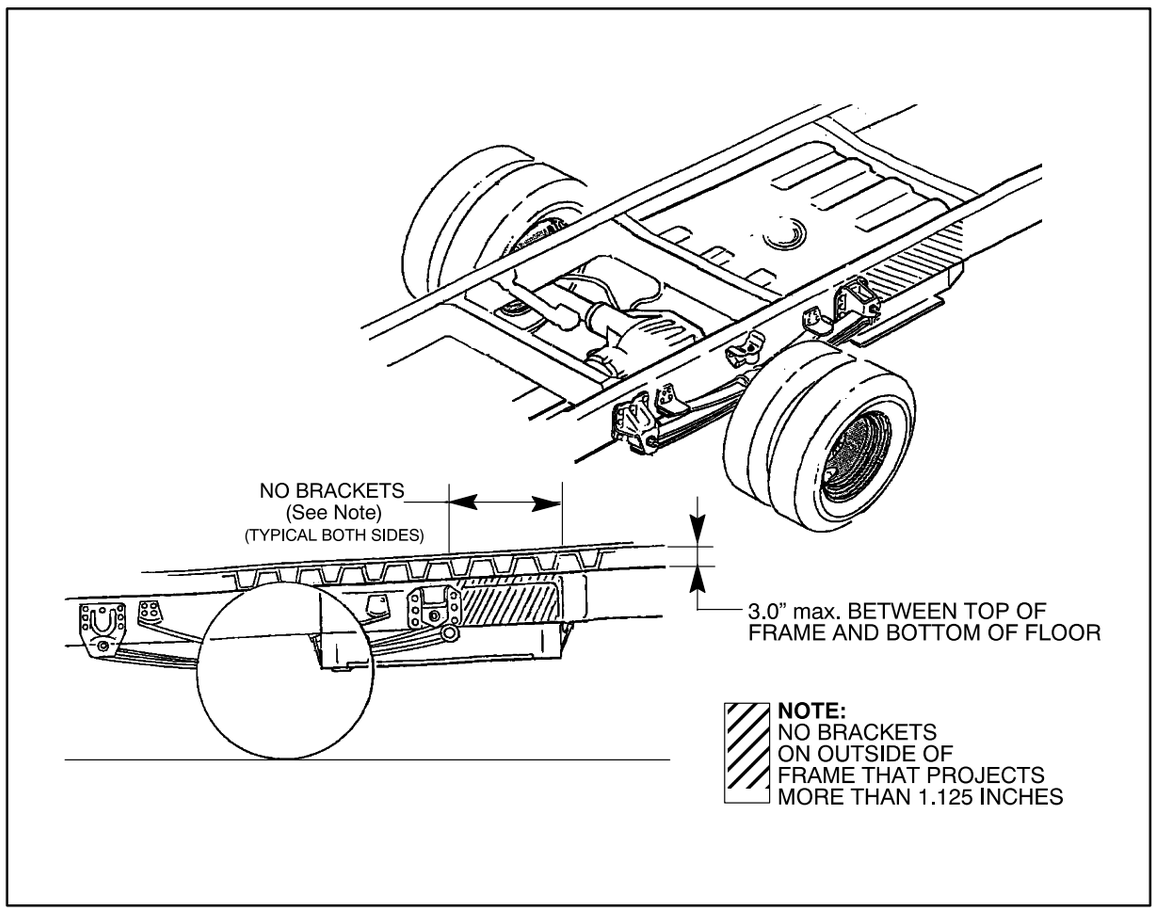
- Underbody exhaust, muffler and tailpipe shields and insulators.
- Rear load floor interior insulation.
- Front floor interior insulation.
- Dash mat insulation.
- Engine cowl insulation–interior and exterior.
- Engine cover insulation.

The following statement applies to P 30042 (school bus) model only

The fuel system for the school bus chassis is certified to FMVSS 301 Barrier Performance requirements based on a body floor height not exceed 3" above the top of frame. The 3" maximum dimension is to be measured from the bottom surface of the interior body floor to the top of the frame. The height of any cross supports and spacers between the bottom of the floor surface and the top of frame are not to exceed this 3" dimension.

No body support brackets that project more than 1.125” outside of the frame are to be attached to the frame rail adjacent to the area of the fuel tank.

1. Any body installed by a subsequent manufacturer is mounted securely to absorb loads and prevent movement relative to the frame which could cause any fuel system component to be punctured, separated or otherwise damaged when tested to the applicable procedures of FMVSS 301.
2. No installed components or vehicle modifications by a subsequent manufacturer impinge on or cause distortion to the fuel system with sufficient energy to puncture, separate. or otherwise damage the fuel system when tested to the applicable procedures of FMVSS 301. Care should be taken that the structural integrity of the vehicle is restored following any structural modifications.



Conversions

Added bodies must be securely fastened to the basic vehicle structure. Do not attach through side rails, but bolt securely through rail flange at floor and added reinforcing plates. A minimum of 10° departure angle should be maintained if frame and/or body is extended.

Chassis

As shown on the chassis drawings, the relationship of the dash panel, brake pedal, clutch bracket and steering column must be maintained to ensure proper operation of brakes and steering.

Body structure must be provided to firmly support the steering column and brake pedal brace in the fore and aft direction and laterally so that the angular dimensional geometry shown on the chassis drawing is preserved. On all “P” truck single axle models, provisions are incorporated in the dash toe, and frame assembly for body assembly attachments. It is imperative that the body assembly structure be integrated to the chassis through the above parts to ensure vehicle structural integrity. If this design criteria is not adhered to by the body builders, General Motors Corporation cannot be responsible or liable for chassis warranty resulting from inadequate attachment of the body or the chassis.

Body underside must include inner fenders so that engine compartment is adequately shielded from wheel splash.

The following statement applies to P 30032 model only.

The front crossmember extension must not be used as a bumper. Body Builder’s bumper should be attached to the front crossmember directly opposite the side rails and to the front crossmember outboard of the side rails as required. ABS module protector extension must be maintained or replaced by equivalent part.

The following statement applies to P 30042 model only.

If the standard front bumper is not used, the Body Builder’s bumper should be attached to the side rails and outboard of the side rails as required. ABS module protector bar must be maintained or replaced by equivalent part.

If the body builder installs seating other than that supplied with vehicle, it is the body builder’s responsibility to ensure that the seating and restraint systems comply with FMVSS requirements. The restraint systems supplied with the vehicle were designed to accommodate the seating reference points and seat travel of the original equipment seats only.

Air Conditioning

For additional information refer to ***Engine - Section 6***.

NOTE: Air conditioning systems using R-134A refrigerant are equipped with metric fittings to prevent interchange with R-12 refrigerant components. Do not interchange R-134A components, refrigerant oil or service equipment with R-12 components, refrigerant oil or service equipment.

Section 2 – Frame

Hole drilling, welding, modifications, or alterations to the frame assembly are the responsibility of persons performing these operations. These same individuals assume complete responsibility for frame assembly reliability, performance after alterations and compliance to applicable FMVSS requirements.

The following procedures and specific precautionary instructions are recommended for proper installation of special bodies and/or equipment on GM frames. Failure to follow these recommendations could result in serious damage to the basic vehicle.

Flanges

Do not drill holes in frame flanges:

- Within 20 mm (0.75 in.) of radius tangent and 25 mm (1.0 in.) of raw edge.
- Larger than 12 mm (0.50 in.).
- Closer to each other than twice the hole diameter.

Holes

Holes to mount brackets, supports, and out-riggers must be drilled in the vertical side rail web with the following restrictions:

- Material between edge of hole and inside of upper or lower flange must not be less than 37 mm (1.50 in.) for low carbon steel (36,000 PSI yield).
- The minimum edge distance between any two (2) holes must be larger than twice the diameter of the larger hole.
- No holes should exceed 20 mm (0.75 in.) in diameter.
- All holes should be drilled in the frame using appropriate drilling practice and safety precautions.

Welding

CAUTION: Fuel tank and fuel lines must be drained and all vapors purged to ensure non-combustible mixture before any welding, brazing or soldering.

When welding low carbon steel side rails, crossmembers and brackets (32,000 or 36,000 PSI yield strength), emphasis is placed upon weld application techniques to avoid stress risers that may adversely affect frame operating stresses.

When welding is performed anywhere on the vehicle, precautionary measures should be taken to prevent damage to electrical system wiring, front suspension air cylinders or components. Prior to any welding, parts or components which could be damaged by excessive temperatures must be removed or adequately shielded; the battery cables should be disconnected at the battery. Also prior to welding, the area to be welded and surrounding area must be cleaned of all frame protective coating. After welding, when parts are cool, carefully inspect wiring and electrical components for shorts or other damage which could draw excessive currents and possibly cause an electrical system short when the battery is reconnected. Apply protective coating to areas where coating was removed.

Alterations

If the wheelbase is modified the alterer must take responsibility for compliance with affected motor vehicle safety standards and for warranty on items such as driveshafts, universal joints, center bearings and rear transmission tailshaft, transmission case fractures, output shaft bushings, bearings, brakes, fuel systems and any other related component failures. Wheel base modifications can affect the operation of the ABS system and may alter vehicle braking stability and or compliance with FMVSS 105. Additionally, the customer must be alerted in the modifier's owners manual that parts for the reworked area are not available through the General Motors service parts system.

Shear Plate Attachments

Attachments of shear plates should be accomplished by using existing manufacturing holes already available in the frame side rails. Manufacturing holes, normally 16 mm in diameter, are consistently placed along the frame side member in the center of the web on each frame.

When additional holes are required for shear plate attachment, they should be no larger than 20 mm (0.75 in.) in diameter. Holes are to be drilled no closer than 63.5 mm (2.5 in.) apart. For holes drilled forward of the rear axle, centers are to be no closer than 63.5 mm (2.5 in.) from the top or bottom flanges and no closer than 89 mm (3.5 in.) from any suspension attachments. For frame holes drilled rearward of the rear axle, hole centers are to be no closer than 51 mm (2.0 in.) from the top or bottom flange and no closer than 89 mm (3.5 in.) from suspension attachments.

No additional holes or notching of either top or bottom frame flanges is allowed.

Body tie-down holes should only be drilled in top flange no larger than 0.76 in diameter; centerline of holes should be 1.0 to 1.12 in. from the web side of the frame rail. Minimum distance between edges of the holes should be approximately 2.0 in.

Trailer Towing

The Incomplete Vehicle Document also specifies that the CG location be within certain limits for proper brake balance, and may be more restrictive than the data mentioned above. The Body Builder must use all appropriate data**.**

NOTE: Failure to keep body and payload CG at least 26" forward of centerline of rear axle will result in degradation of trailer towing capacity. Consult with your Body Builder/Final Stage Manufacturer to determine maximum tongue load for your vehicle.

Section 3 – Front Suspension

See chassis data information for clearances and assistance in calculating trim heights.

Clearance should be provided for the tire used while in full jounce (upward travel) against metal stops and at full left-hand and right-hand turn. The envelopes will be provided upon request. See ***Section 5 - Brakes***.

Allowance for the tire chain clearance shown on a maximum grown tire must allow for (1.66 in.) clearance to the sides of the tire and (2.5 in.) to the top of the tire. Be sure sufficient clearance is provided for suspension, axle and tire and wheel in full vertical travel (up and down).

NOTE: Notification to the consumer may be required in certain states if tire chains cannot be used.

Vehicles equipped with 3650 lbs. low height independent front suspension (IFS). The urethane air cylinders must be maintained at 70 psi. If the vehicle is also equipped with option 9Q6, right side air cylinder should be set at 50 psi instead of 70 psi. Vehicles equipped with 4500 and 5000 lbs. independent front suspension (IFS) urethane air cylinders must be maintained at 50 PSI; with 5500 lbs. independent front suspension, air cylinders must be maintained at 90 psi. Air cylinders when provided must be shielded during welding operations.

Since there is a large variation in completed vehicle front weight due to differences in body weight and equipment, the front suspension alignment (caster, camber and toe) must be checked and reset if necessary after the vehicle is completed. The suspension must be reset by the Body Builder if it is found that the setting's do not conform to the specifications as outlined in the "P" Chassis Service Manual. On P 30042 trucks with I-beams, camber and caster is designed into the axle/suspension and cannot be adjusted.

See Truck Service Manual for complete alignment procedure, specifications under "Diagnosis and Front Alignment" section.

The following statement applies to P 30042 models with I-beam front axle.

The front crossmember steering gear attachment is a weldment. Under no conditions may the flanges be cut or notched out in any manner. Any alteration would severely affect steering attachment capabilities.

Section 4 – Rear Suspension

Clearance to body should be provided for the suspension, axle, driveshaft and tires under the following conditions: (1) Axle in full jounce against the metal-to-metal stop, (2) Axle at 4.5° roll with one side of axle in full jounce at the metal to metal stop and (3) Axle at design position. Allowance for the tire chain clearance shown on a maximum grown tire must allow for (1.66 in.) clearance to the sides of the tire and (2.5 in.) to the top of the tire. Be sure sufficient clearance is provided for suspension, axle and tire and wheel in full vertical travel (up and down).

NOTE: Notification to the consumer may be required in certain states if tire chains cannot be used.

Pipes, wiring, conduits and any other related components must not be placed where they cross the path of motion of the rear axle, driveshaft, axle brake pipes, hoses, spring or tires. Such crossing could result in rupture, wear-through, or separation due to normal axle motion.

See chassis data information for additional clearances and for assistance in calculating trim heights.

Section 5 – Brakes

See Truck Service Manual for brake specifications.

Due to the critical nature of brake systems, anyone making modifications or alterations must assume complete responsibility for system reliability, performance and certification to FMVSS 105 or FMVSS 121.

It is mandatory that no change be made to the brake main cylinder location, brake pedal push rod length or pedal position.

Ensure that hydraulic brake system is free of air and hydraulic leaks. Bleed brakes if required, following procedures as outlined in truck chassis service manual. Ensure that vacuum booster system or hydroboost system is functional and free of leaks.

Check master cylinder fluid level and fill as necessary. (Refer to Owner's Manual)

Check power steering fluid level for models equipped with hydroboost brake. (Refer to Owner's Manual)

Added floor covering or carpeting must not restrict service or parking brake pedal travel from released position to full pedal travel.

The body builder must provide access to brake master cylinder to enable fluid level check and the ability to add fluid as required. Clearance to master cylinder should be provided to enable its easy removal and replacement if ever required. Visual access to warnings printed on master cylinder reservoir must be provided per FMVSS 105.

The body builder must also provide access to auto-apply parking brake actuator switch on all 16,500 lb. GVW chassis. Opening for service in brake shield on chassis below drivers island must remain clear.

No body part or chassis-mounted component including wheel house shields may be located within 2.0 in. of brake hose routing and/or wheel speed sensor wire in all wheel and axle positions. All exhaust system components must also have a minimum of 2.0 in. clearance to brake hoses in closest positions. (Be sure to account for brake hose and sensor wire travel with suspension).

Body builder is to verify that the brake light switch and brake warning switch is operative. This includes both the brake system differential pressure and parking brake actuator switch. Any ABS system codes that may have been set due to the body build process must be checked and cleared prior to customer delivery.

The following statement applies to models with B3D school bus option only.

Hydroboost systems are equipped with a brake fluid flow indicator. Alarm system must be completed by the body builder. Shipped in a loose parts box are a buzzer module, time delay module and wire harness, which must be installed per instructions shipped with the loose parts box.

Floorboard and toe pan position cannot be altered, as it will interfere with brake and accelerator pedal movement or cause driver discomfort. The floor may be covered with normal pad and carpeting only (except P30032/42 models). No floor covering should be under the accelerator pedal area it will interfere with accelerator control movement. Carpeting must have 1" minimum clearance to the accelerator pedal and should be cut-pile only. Carpeting must be properly secured to prevent any movement.

Parking brake installation and adjustment procedure:

1. Secure vehicle in place with hoist or wheel chocks and place vehicle transmission in park position.
2. Front cable routing throughout body must have a minimum radius of 6 in. and be protected from all moving components and sharp edges.
3. For transmission mounted parking brake:

The following applies to all P 30042 models with the exception of P 31842 & MT9

Hand lever

1. Release parking brake handle and remove cotter pin, washer and clevis pin inserted from outboard side of vehicle. Mount handle convenient to driver comfort range.
2. Feed cable through body and reattach to handle with clevis pin inserted from outboard side of vehicle.
3. Readjust parking lever knob to give a definite snap-over feel (approx. 60 lbs.) when the lever is applied. With the lever in the applied position, the forward edge of the clevis pin head should be approximately 5/8 in. from the end of the adjusting slot on the bracket.
4. Do not alter the drum or cable adjustment at transmission unless routine service is required in order to obtain the desired setting above. No drag should be present after parking brake handle is released.

The following applies to all P 30032 models and P 30042 & MT9

Foot pedal

1. Release foot pedal and remove cotter pin, washer and clevis pin inserted from outboard side of vehicle. Mount pedal coinvent to driver comfort range.
2. Feed cable through body and reattach to handle with clevis pin inserted from outboard side of vehicle.
3. Readjust parking brake pedal to give a firm pedal at 2-5 clicks (P 30032) and at 8-16 clicks(P 30042 & MT9) when the pedal is applied. With the pedal in the applied position the forward edge of the clevis pin head should be approximately 5/8 in. from the end of the adjusting slot on the bracket.
4. Do not alter the drum or cable adjustment at transmission unless routine service is required in order to obtain the desired setting above. No drag should be present after Parking brake is released.

For rear axle mounted parking brakes (P 30800, P 31100, P 31432 with out JF9):

1. Release parking brake handle and remove connector between front and intermediate parking brake cables. Remove front cable from frame bracket and floor pan assembly.
2. Feed cable and handle assembly through body and re-attach handle to body convenient to driver's comfort range.
3. Feed cable back into frame bracket and making sure tangs lock into position. Place connector back on front and intermediate brake cables.
4. With lever in the applied position, turn adjusting knob to give 5/8 in. clearance from forward edge of clevis pin head to end of adjusting slot in bracket.
5. Do not alter rear brake drum adjustment or cable equalizer unless routine service is required in order to obtain the desired settings above.

Auxiliary Braking Systems

If add-on braking systems are installed to control either tag axle or trailer braking systems, the body builder is responsible for the integrity of the system. This may require running FMVSS certification tests. Any change to the GVWR necessitate, recertification to FMVSS. Care must be taken to assure that flow rate of the brake fluid is not affected by the modification, as this could reduce the effectiveness of the ABS system. The recommendations of the auxiliary brake device manufacture should be followed in making the modifications. For most systems that require a tap-in is best done near the rear axle of the vehicle. This allows any proportioning of the rear brakes to be communicated to the auxiliary brakes. This tap-in should not require more than .02 cu. in. of fluid, and be capable of withstanding pressures up to 3000 psi. Auxiliary brakes must be capable of taking the proportion of the braking load, for which, they are designed to provide for the overall vehicle (combination) irrespective of fade or other operating effects.

Section 6 – Engine

For additional information refer to ***Section 1 – Body.***

Air conditioning and auxiliary belt-driven equipment installation recommendations:

No alterations or additions to the accessory drive belt system will be warranted on serpentine belt systems.

The serpentine belt type of drive is designed as a total system, incorporating a single poly V-belt and an automatic tensioner. In this type of system, degrees of pulley wrap, belt tension, and pulley alignment are very critical factors. Modification is not recommended.

Due to the critical nature of the accelerator system, anyone making modifications or alterations assumes complete responsibility for system reliability, performance and compliance to FMVSS 124. Caution must be exercised so that the accelerator cable is properly routed. Specifications are as follows:

- Route cable to maximize all bend radii. In no case should bend radii be less than 3 in. (76 mm).
- Minimum distance from exhaust manifold to be 6.0 in. (150 mm), unless a heat shield is provided.
- Do not use accelerator cable or clips to route wires, harnesses or other cables. Cable sheath must be clipped so as not to pinch inner cable. Cable must not be loose in clip allowing sheath to move when accelerator pedal is applied and released.
- Cable must not be subjected to kinking or routing across any sharp edges.
- Cable routing must be perpendicular to the surface of the front-of-dash at the dash fitting. No objects or routings should force cable to have a bend at the dash fitting. Flexible components (hoses, wires, conduits, etc.) must not be routed within 2.0 in. (50 mm) of moving parts or accelerator linkage unless routing is positively controlled.
- Caution must be taken so that the accelerator pedal remains properly located. Guidelines for accelerator pedal locations are as follows:
  - — Ensure that the accelerator can freely operate from idle to wide-open throttle position and return. Make sure that the pedal will not hang up on any nearby items such as carpets, floor, screws, wiring harnesses, etc. Engine cover should have at least one inch (25 mm) clearance to side of accelerator pedal with the carpet mat installed. No floor covering should be installed under pedal area.
  - — Accelerator to brake pedal relationship has been designed to provide minimum driver movement and should not be altered in any way.

Gasoline engine induction and/or ignition system is certified in compliance with the Federal Vehicle Emission Standards. Any alterations to the systems or components could void compliance and render the vehicle illegal. System includes:

- Fuel system – Sequential port fuel Injection (SPFI), central port injector (CPI) and associated tubes, hoses and pipes, air cleaner outside air hose, fuel pump and inlet manifold and fuel vapor canister.
- Exhaust system.
- Ignition system distributor and initial spark timing setting, spark plugs, spark plug wires.

- Crankcase ventilation system.

Diesel engine induction and injector pump system is certified to be in compliance with the Federal Vehicle Emission Standards and/or Noise Standards. Any alterations to the system or components could void compliance and render the vehicle illegal. System includes:

- Fuel system – Injection pump, injector lines and injectors, fuel return hoses and pipes, air cleaner, outside air hose, fuel pump, fuel filter, fuel heater assembly and intake manifold.
- Exhaust system.
- Crankcase pressure regulation system.
- External engine components such as air cleaner, crankcase pressure regulator valve, alternator, injection pipes, fuel return hoses from injectors, exhaust manifolds, oil fill pipe, etc. must be provided with sufficient clearance for engine roll and torque.
- When a vehicle is equipped with a electronic fuel injection (EFI) engine, it has an engine control module ECM/PCM/TCM or VCM. This ECM/PCM/TCM or VCM must be maintained at a temperature below 185°F at all times. This is most essential if the vehicle is put through a paint baking process. The ECM/PCM/TCM or VCM will become inoperative if its temperature exceeds 185°F. Therefore, it is recommended that temporary insulation be placed around the ECM/PCM/TCM or VCM during the time the vehicle is in a paint oven or undergoing another high temperature process.

Engine starting instruction label location. Label should be installed 2 in. above driver's sunvisor bracket and 2 1/2 in. to the left of the right hand bracket.

The following statement applies to models with remote mounted air cleaners:

The Body Builder must install the air inlet duct such that it provides cool dry air to the air cleaner. Radiator baffling must be provided to prevent recirculation of air through the radiator. The air inlet must be shielded from water and snow that may come from the road, tires and through the grille.

The air cleaner position and ducting between the air cleaner and engine should not be modified.

The following applies to P models with L29/L31/L35 engines:

The relationship of the air cleaner assembly to the Mass Air Flow sensor (MAF) as positioned by the air cleaner elbow cannot be altered. The MAF sensor black electronic module must remain 30° forward of vertical.

The following statement applies to P 30032 models with a 6.5L turbo diesel engine.

CAUTION: Do not run the engine with the air cleaner or ducting to the turbo removed. Serious personal injury or damage to the engine could result.

Apply a Caution label on the turbo inlet ducting.

Apply Starting Fluid Warning label in a visible area near air intake duct inlet.

Refer to information in the Loose Parts Box for labeling and air inlet duct part numbers.

Section 7 – Transmission

Light duty models equipped with manual transmission have a clutch-operated start safety switch. Starter should operate whenever the ignition is turned to start and the clutch is fully depressed. The clutch-operated start safety switch is integral with the clutch master cylinder push rod. It is ***not*** adjustable.

Models equipped with automatic transmissions and column shift control have a steering column mounted neutral/park start safety mechanical lockout feature, which interfaces with the steering column ignition switch. Starter will only operate when gear shift lever is in the neutral or park position. Re-adjust the shift linkage if necessary as outlined in the Truck Service Manual.

Transmission shift cable must be routed and clipped properly to avoid contact with hot surfaces such as exhaust manifold or EGR pipe.

NOTE: Remove the shift cable clearance tag from the EGR tube after shift cable routing.

Models equipped with brake-transmission shift interlock (BTSI) must fully apply the regular brakes before you can shift from park when the ignition key is in the run position.

Models equipped with manual transmission use a hydraulic clutch actuator. Check fluid level as outlined in the vehicle owners manual. Attach manual transmission shift lever boot to floor using four 11514843 screws or equivalent.

It is mandatory that no change be made to the clutch master cylinder location, clutch master cylinder push rod length, or pedal position.

After installation of the body, vehicles with automatic transmissions should have the shift linkage checked and adjusted if necessary as outlined in the Truck Service Manual.

Shift Cables

- Control cables should be supported or anchored to prevent sag when suspended overhead and to prevent movement where the routing bends.
- On long control runs the conduit should be clamped to supporting structure at least every 48 inches.
- Supports should be placed at the end of the straight runs, and not in the middle of a bend.
- Care must be taken that the clamps do not collapse the conduit and increase control friction.
- Controls should be routed so that they will avoid rubbing, pinching and extreme heat, cold or vibration.
- Bend radius to be 6.0 in. minimum.

Section 8 – Fuel and Exhaust

Fuel Systems

Any body installed must be mounted securely to absorb loads and prevent movement relative to the frame which could cause any fuel system component to be punctured, separated or otherwise damaged when tested to the applicable procedures of FMVSS 301. No other installed components or modifications are allowed which could impinge on or cause distortion to the fuel system with sufficient energy to puncture, separate or otherwise damage the fuel system when tested to the applicable procedures of FMVSS 301. Due to the critical nature of the fuel system, anyone making modifications or alterations to the existing system, except as specified in the Incomplete Vehicle Document or in this manual, must assume complete responsibility for the systems reliability, performance and compliance to FMVSS 301.

Assembly of any fuel system components may require application of a lubricant to prevent contamination of the fuel system, only GM lubricant 9985784 may be used.

The fuel evaporative emission control equipment is certified to be in compliance with the Federal and California Vehicle Emission Standards. Metal fuel lines and fuel tanks have a surface coating to reduce corrosion on inside and outside surfaces to comply with useful life requirements. All fuel hoses are made of a low permeation multilayer material to comply with enhanced evaporative emission requirements. Any alterations to systems or components including materials, hose lengths and their location, except as described in the fuel fill system modifications section, could void compliance.

The system includes:

- Fuel tank, fuel level sender, fuel fill and vent hoses and pipes, emission canisters, fuel feed, fuel return and vapor lines, purge control solenoids, fuel fill cap and canister vent solenoid.

For these reasons,

NO ALTERATION OF THE FUEL SYSTEM IS RECOMMENDED

Temporary Tank

The temporary fuel container must be replaced with a permanent fuel tank prior to placing the vehicle into use. The replacement tank supplier and/or body builder is responsible for certifying evaporative emissions.

The following statement applies to motorhome chassis only.

The unit is fueled during shipping (gas engines only) from a temporary fuel tank which contains the tank unit for the main tank. The temporary tank is to be removed and scrapped. Transfer the tank unit with O–ring seal to the main tank. The fuel cap for the main tank filler neck is the same as on the temporary tank. Remove the tank unit hole cover and lock ring. Discard ***only*** the tank unit hole cover and the lock ring. Reinstall the seal, lock ring and the tank unit assembly.

The 75 gallon fuel tank (RPO NJ9) as received has a vented plug marked “For Shipping Purposes Only”. This plug is to be removed and a solid steel plug shipped in the ship loose box must be installed in place of the plug removed.

The 75 gallon fuel tank (RPO NJ9) is provided with rear shields to provide protection for the departure angle shown on the fuel tank arrangement drawing. Any alteration or deletion of these shields requires that an equivalent departure angle of protection be provided by the completed vehicle.

The following statement applies to commercial models with option B3D only.

The CPI fuel system for standard models is connected to the regular fuel tank. The fuel system for option B3D gasoline and diesel school bus models is also equipped this way.

A fusible plug is included in the loose parts box. This must be installed into the tagged hole in the tank to replace a plastic shipping plug.

Fuel Fill

Fuel tank filler pipe location should be so situated and constructed as to prevent gasoline vapor from emitting to vents of pilot flamed devices and to body and engine compartment air inlets.

It is recommended that when mounting the fuel filler pipe assembly and vent hose that a minimum of 3" clearance be provided to any body component to prevent contact between hoses and/or mating parts and that retention be provided to ensure routing and prevent failure due to wear and fatigue. Filler pipe and vent line must have a gravity fuel flow to tank at all times; no fuel traps are allowed. Alterations of fuel line routings could affect the ability of the completed vehicle and are, therefore, not desirable. The complete fuel system must comply with FMVSS 301.

If additional new hose is required when installing fuel tank filler neck, this hose must be suitable for use with unleaded fuels or diesel fuel respectively and must allow the vehicle to meet enhanced evaporative emissions requirements.

The fuel fill inlet pipe assembly attached to the body must be grounded to the frame structure with the ground strap and fasteners provided in the shipped loose box.

Fuel Lines

Fuel line routing precautions:

- 12 in. minimum clearance to exhaust system is required or a metal shield must be provided.
- Fuel lines should be clipped to chassis to prevent chafing. Metal clips must have rubber or plastic liners.
- Use corrosion resistant steel tubing with short sections of approved hose to connect components. Hose-to-tube connections should be clamped for diesel systems. Steel tube ends should be beaded for hose retention. Fuel supply is pressurized by an in-tank pump for CPI systems. Coupled hose or nylon quick-connects must be used. Clamped hose is not acceptable for CPI systems.

All engines require a fuel return system which returns excess fuel from the injection pump and injector nozzles back to fuel tanks. Care should be taken that these lines are not blocked nor their hoses pinched. The engine may run poorly or stall if these lines are restricted or blocked.

All gasoline engine vehicles are equipped with fuel evaporative emission control equipment which is certified to be in compliance with the Federal or applicable California vehicle emission standards. Alterations to fuel tank and metering unit, lines, canister or canisters, canister filters, canister purge control valves, relay switches, tank auxiliary vent valve, engine speed controller, or other devices/systems are therefore not allowable since vehicle adherence to C.A.R.B. and Federal regulations may be affected.

Diesel powered vehicles incorporate water drain provisions in the fuel system. These valves are only to be opened when siphoning water and contaminants from the fuel system.

Fuel Tank

For vehicles with full frames, the tank must have a minimum clearance of 2 in. top, front, rear and sides to body and other supports.

Tank may be pressurized with nitrogen (Do not use air with fuel in the system) to 1.25 PSI maximum to check for final line leakage or for forcing fuel through the system. Pressures greater than this amount may be detrimental and affect tank durability.

The following statement applies to commercial models only.

Tapping into the main fuel supply line to get fuel for a powered motor generator is not recommended since this could result in fuel starvation, vapor lock problems and running the fuel tank dry. It is not permissible to draw fuel from a fuel return line. The fuel meter assembly has a anti-siphon feature in the return line that prevents fuel from being drawn out.

The following statement applies to motorhome models only.

The 40, 60 & 75 gallon gasoline tanks will include a fuel draw tube in the top of the tank assembly. This is provided for body builders to use for generators. The body builder should remove the pipe plug in this fitting and plumb system to the generator from this pickup point. Added auxiliary power unit must use the same fuel as the chassis engine or a separate fuel system will be required.

The use of auxiliary fuel tanks is not recommended. If an auxiliary fuel tank is added, the alterer must take responsibility for compliance with affected motor vehicle safety standards. Also, if an auxiliary fuel tank is added to a gasoline-powered vehicle, the fuel must be drawn through a pipe at the top of the tank (balance line between tanks is not permitted).

Gasoline fueled vehicles are now equipped with a fuel pump return line. If an auxiliary tank is added, the tank selector valve must include a return port which returns fuel to the tank from which the fuel is being drawn.

In gasoline engines the fuel pump is located in the fuel tank. The battery must be disconnected before starting any work on the fuel system.

In the use of dual fuel systems, the vehicle operator should strictly adhere to the manufacturer's procedures for switching from gasoline to gaseous fuel operation. Improper switching procedures may result in overheating and damage to the exhaust system and the vehicle. The gaseous fuel tank should not be mounted in an enclosed area of the vehicle, such as the passenger compartment, truck, etc., and the system should be vented to the outside of the vehicle. In addition, vehicles converted to gaseous fuels should not be stored in enclosed places such as garages. Further, General Motors cau-

tions purchasers that the design, location and installation of any type of fuel storage system involves significant technical and engineering considerations and that these statements on gaseous fuel conversions should not be interpreted to be an approval by General Motors of any modification to the original equipment fuel system.

Conversions to gaseous fuel should be made in conformance with applicable Federal and State regulations. Removal of emission-control components, or the addition of gaseous fuel systems which could damage or reduce the longevity of those components and could also cause the mechanical and emission performance warranty to be voided.

Exhaust System

Particular care should be taken to prevent the possibility of exhaust fumes and carbon monoxide exposure to vehicle occupants in units completed by body builders. Holes and openings through the floor and all other parts of the body must be permanently and adequately sealed by the body builder to avoid exhaust intrusion into any occupant area. If it is necessary to change the exhaust outlet location, the exhaust discharge must be unobstructed and directed away from occupant areas. Alteration of the exhaust outlet or its position may increase exhaust noise and render the vehicle illegal in those areas with pass-by noise regulations. All vehicles >10,000 lbs. GVWR come under Federal noise regulations, vehicles ≤10,000 lbs. GVWR are regulated by various state and local regulations of the Environmental Protection Agency; see those regulations for rules, test procedure and noise levels permitted.

Tail pipe outlet location must be tested statically and with the vehicle in motion to ensure that exhaust gases do not penetrate side or rear windows or under body seams and holes. Auxiliary power plants should also be tested under the same conditions. Tail pipe extension must extend 2.0 to 2.5 in. outboard of body side panels. Tail pipe exit ahead of rear wheels is not recommended.

Check for leaks in exhaust systems and repair as required.

Exhaust temperatures can exceed 1600°F under extreme operating conditions, with pipe surface temperatures slightly less than this. Extreme care must be used when placing body components in the proximity of the exhaust system so as not to exceed the rated temperature limits of the components. Due to variants in underbody configurations of the vehicles, we are not in a position to make recommendations on how to insulate or design components in the proximity of the exhaust system.

Each manufacturer must make temperature checks of critical areas of his vehicle and adjust his design accordingly, or provide shielding to ensure safe operation of his body components.

The same can be said for the engine compartment. Obviously there will be additional heat radiated from the engine. How much is retained in the area will depend on how well this area is ventilated in your individual designs. Here again, temperature checks of interior areas surrounding the engine should be made to determine if your insulation is adequate. This is the same engineering practice we have followed on our complete vehicles incorporating these exhaust systems.

Exhaust system materials are selected and tested to withstand the operating environment of the vehicle. Do not modify the exhaust system in any way. The tail pipes are made of 409 stainless steel or aluminized 409 stainless steel.

Heat shields are mounted to the underbody and/or exhaust system components (catalytic converter and muffler). Shields for the propshaft hanger bearings are also provided in some vehicles.

Section 9 – Steering

Check power steering fluid level and system operations. (Refer to Owner's Manual)

Steering wheel and horn pad must not be altered or replaced.

The following statement applies to motorhome chassis only.

Steering wheel and shaft must be located and supported as shown on the body builders drawing.

Section 10 – Tires/Wheels

Check wheel lug nuts for proper torque; specifications are provided in the Owner's Manual.

Substitution of tires of greater capacity than those offered as original equipment by vehicle manufacturer is not approved for use on original equipment wheels. Any usage of higher capacity tires must be accompanied by higher capacity wheels. However, the wheel offset and distance from centerline of rim to wheel mounting face must be the same as the replaced original equipment wheel to ensure proper wheel bearing loading and clearance of tires to body and chassis components.

Increasing tire and wheel capacity does not necessarily increase vehicle GVW ratings.

It is recommended that tire chain clearance guideline, J683 from the Society of Automotive Engineers be adhered to in designing rear wheelhouse clearance.

Check tires and inflate to recommended tire pressure according to the tire pressure information displayed on the certification/tire label provided with the vehicle before shipment of vehicle from Body builder.

Any substitution of tires may affect Speedometer/Odometer accuracy.

If the body builder installs wheel covers on the vehicle, vented covers must be used. The minimum vent area is to be the greater of 34 in.2 or 90% of the original vehicle's wheel vent zone. Air flow through the wheel vent and cover vent must be direct.

Section 12 – Electrical Battery and Battery Cables

The vehicle battery should be located and positioned to make use of the existing battery cables. If the battery requires relocation and longer cables are required, a proportionately larger gauge wire must be used. If in relocating the battery the negative ground cable is attached to frame rail, a cable of similar gauge be provided between the frame rail and the engine. This is required due to the heavy electrical loads imposed by the starting circuit. To ensure proper operation of the battery cables the following chart on length, gauge and materials must be strictly adhered to:

Combined Length of Positive and Negative	
Cable Gauge	**Cable in Inches (Copper)**
4	66
2	107
0	170

If the battery requires relocation in the engine compartment, the OEM supplied generator with flat-compensated regulator must be replaced with a generator with temperature compensated regulator to regulate system voltage compatible with underhood battery temperatures.

Underhood Battery Location	
OEM Part No.	**Substitute Part No.**
10480170 (105 A)	10480168 (105 A)
10480267 (124 A)	10480255 (124 A)

If the battery is relocated in the engine compartment without replacing generator as stated above, it will effect the battery life and will be reduced by 50% of the average battery life.

Battery Installation

The battery and cable installation, provided by the body upfitter, must comply with the following guidelines. Non-compliance may result in a failure of the vehicle electrical component system, the shutdown of the engine, loss of backup brake system, loss of ABS braking control, and the possibility of fire.

- The cables must not contact any sharp edge(s), in either the normal (stored) or slid (maintenance) position (school bus application).
- The cables must not be bent in a radius of smaller than 10 times the cable diameter. Insulation failure can occur if this happens.
- The cable must be supported by clips spaced at a distance of not more than 450 mm. In this clipping, they shall not have a free movement that will allow rubbing on any vehicle component, either fixed or moveable.
- All clips used must be of the rubber-lined type, not rubber dipped.
- Do not splice the battery cables. Cable modifications can result in vehicle starting problems and loss of other key systems.
- The cables must be clipped to the battery tray such that the cable pull loads are not transferred into the battery posts due to slide tray movement. Failure to do so can result in loose terminals, poor starting and battery failure. Battery acid leakage could result around posts not properly relieved of strain.
- The cable attachments at the battery terminal must not cause undue strain at these connections. There should be no sharp bends in the cables adjacent to the connections. The cables should be routed down from the terminals rather than horizontally from the terminals to prevent a lever action that may loosen connections. Terminal corrosion inhibitors and other coatings should not be applied to the sealed electrical contact areas. Terminal torque of the sealed terminal shall be 10/20 N-M freedom, 14/20 N-M linehaul.
- Mounting Base (Tray):
  The tray should be of substantial material (minimum 1.75 mm thick or sufficiently reinforced) to resist flexing and cracking. The tray must provide firm, continuous support of the battery and not amplify vibration levels. There must be no protrusions or projections in the tray or mountings that would damage the battery. Cantilevered mountings are not recommended and the tray should be mounted flat so as not to aggravate electrolyte spillage or lead fatigue. A rounded lip of adequate height to ensure stiffness and retention should be provided around the perimeter of the tray. With the battery mounted in a vehicle, a static force of 22 kg applied to a 6.54 sq. cm. area at any corner should not move the battery any more than .25 mm.
- Freedom Battery:
  The hold-down must be able to prevent the battery movement relative to the mounting base or hold-down. Torque at the battery hold-down shall be 15/20 N-m (133-177 lbs.-in) at the base clamp or 2.3/4.5 N-m (20-40 lbs.-in.) at the top bar. A bottom hold-down centrally located at the sides of the battery is recommended.
- Linehaul Battery:
  A tight, secure hold-down is essential. Hold-down brackets must retain the battery at a 22G-3 millisecond shock loading. A top hold-down should be spaced

a minimum of 15 mm from terminal posts to avoid possible ground paths. If a top hold-down is used, a non-corrosive, non-conductive coating is desirable.

Location:
The battery should be located in a well ventilated area where a temperature build-up does not occur. The location should also provide protection to the battery to prevent damage from foreign objects. The ends of the battery in the area of the vent ports should be free of obstructions so that the gasses generated during charging can be freely dissipated into the atmosphere.

- Accessibility:
  The hold-down should be convenient for tools and hands so that personal injury does not occur. There should be clearance at the insulated and grounded terminals so that wrenches can be used so that accidental grounds or shorts will not occur. Terminal polarity markings, warning labels and test hydrometer should be visible. The battery "ground" connection must be readily accessible for disconnection, as required for vehicle electrical service requirements.
- Tilt Angles:
  For normal vehicle operation (at GVW), the battery should not be tilted (0°). For installation or removal, it should not be necessary to tip or tilt the battery in excess of 40°. This is to prevent acid spillage. For short duration vehicle shipment, do not tilt the battery more than 19° from the horizontal.
- Temperature:
  The temperature of the electrolyte should not exceed 52°C. Infrequent peak temperatures to 75°C can be tolerated in soak situations only. Shielding may be required to protect the battery from a source of excessive heat.
- Battery Trays:
  Battery trays are supplied with the chassis. In the case of motor homes and diesel school busses, the trays are secured to the frame rail (for shipping only).

  The trays shipped on the rails may be relocated to other areas on the vehicle, keeping in mind the recommendations noted above.
- Battery Storage:
  Today's vehicles have several electronic devices which result in very small but continuous current drains on their batteries, commonly referred to as "parasitic" loads. Vehicles that are not used for an extended period of time may develop extremely discharged and/or permanently damaged batteries resulting from these parasitic loads. Discharged batteries can freeze at temperatures as high as 20°F causing permanent damage.

  To alleviate this condition, check to make sure green dot is visible, recharge as necessary, then disconnect the negative battery cable on vehicles which are not going to be in service within a 30 day period. If this is not possible, batteries should be recharged periodically (every 30-60 days) until the green dot is visible.

NOTE: The ignition switch must be off when connecting or disconnecting battery cables or hangers (jumper cables). Failure to do so may overstress or damage the ECM/PCM/TCM, VCM, ABS or other electronic components.

Modifications/add-on wiring must be carefully reviewed to ensure compatibility with the base vehicle wiring by reviewing the vehicle electrical system mechanization prints, detailed harness prints and Delphi–Packard electric division connection system design quality guidelines. Due to the wide range of modifications that may be required for vocational needs, it is not feasible for the O.E.M. to take into account all potential revisions. For this reason, any person modifying existing vehicle wiring must assume responsibility that the revisions have not degraded the electrical system performance. Any add-on wiring must be properly fused and routed to prevent cut, pinch, and chafe problems, as well as avoid exposure to excessive heat. Care must be exercised that existing vehicle interfaces do not have their current load capabilities exceeded, and that the respective control devices are not overloaded. Added wire size should be at least as large as the the wire to which it is attaching in order for fuse protection to be maintained.

A Packard electric wiring repair kit is available through Kent–Moore (GM P/N 12085264, Kent–Moore P/N J38125-4). This kit contains instructions, tools and components for making repairs to wiring harness components. This kit would also greatly assist in accomplishing necessary add-on wiring such as body marker lamps, so that system reliability/durability is maintained.

Electrical wiring components can be obtained through your authorized GM dealer. Many Packard Electric components are also available through Pioneer Standard Company (1-800-PACKARD). Pioneer may also be able to assist in making necessary wiring additions by providing custom wiring stubs or jumpers to your specifications.

Fusible Link Repair Procedure:

1. Cut damaged fusible link from wiring harness assembly splice.
2. Strip insulation from harness wire as required to splice on new fusible link.
3. Fabricate a new fusible link wire approximately 6 to 8 in. long from the same wire size as the original link. (Acceptable fusible link material will be imprinted with the wire size and the wording to identify it as fusible link. Fusible link cable is not the same as normal vehicle wiring.)
4. Terminate fusible link harness wire with a suitable compression splice clip, and solder with an electrical grade rosin core solder. Wrap splice area with tape to provide electrical insulation, as well as mechanical strain relief at the splice.
5. Strip, terminate, solder, and insulate remaining end of fusible link with appropriate termination to be compatible with the rest of the electrical system.
6. For further information, refer to the instruction manual in the wiring repair kit referenced elsewhere in this section.

Section 13 – Heating/Cooling

To provide satisfactory engine cooling, the following conditions must be met:

- The minimum frontal area for the Chevrolet/GMC is 360 square inches, to be directly in front of the radiator. If the vehicle grille area is not directly in line with the radiator face, filler panels between the radiator and grille must be used to direct the air through the radiator. Any area outside of a 45° angle from the edge of the radiator should not be considered as grille open area, for cooling.
- The grille opening should be 'open' in configuration. Small holes for the grille opening tend to restrict air flow more than large holes although both may have the same frontal area.
- Cooling can be improved by inserting filler panels between the outer vertical side edges of the radiator and grille. In addition, a filler panel should be fitted horizontally from the bottom of the radiator out to the bottom of the grille. This will prevent air from by-passing the radiator and exiting through the front wheel house area or under the radiator. These panels will force the air through the radiator.
- A flexible air-tight seal must be provided between the upper radiator support and the body to aid idle cooling and prevent hot air recirculation. The seal assures that incoming 'ram air' must go through the radiator core rather than by passing the radiator core (going up and over the core).
- Bug screens should be avoided if at all possible. If conditions require a bug screen, motor home owners are advised to be alert to possible engine overheating problems as well as temperature changes. The screen's mesh should be-at most-half as dense as that of standard household screening. Household screening will create an overheating condition. The bug screen should be removed immediately upon leaving the bug infested area.

  Do not install any internal flow restrictors.

  The 3 way or 'H' valve is not required in the heater system for port fuel injected engines.

Coolant Recovery Bottle:

1. Mount the coolant recovery bottle in an easily accessible area with the top approximately the same height as the radiator fill cap. The bottle must be supported by the two attaching embossments at the top and also by the rib at the bottom of the bottle to prevent failure of the unit. You may use the supplied bracket and rework as required for proper mounting.
2. Hose may be cut to proper length as required to reach from the radiator overflow tube just under the radiator cap to the larger diameter nipple on the coolant recovery bottle cap. Retain the hose by using two 5/8 in. hose clamps.
3. For the initial fill of the coolant recovery bottle, fill to the "hot" mark on the bottle. This allows the system to initially purge itself and maintain the proper coolant level. Refer to the Owner's Manual for proper mixture.

The following statement applies to P 30042 models only.

Radiator support assembly is not a structural member. No body mounting supports or other attachments used for structural purposes are to be fastened to radiator support assembly. Example: Horns should not be mounted on the radiator support assembly.

The following statement applies to P 30032/42 diesel models only.

For diesel engines, a de-aeration tank is added to the cooling system. This system will pass normal combustion gases out of the cooling system. The de-aeration cooling system includes a de-aeration tank, radiator, fitting and hoses.

Heater

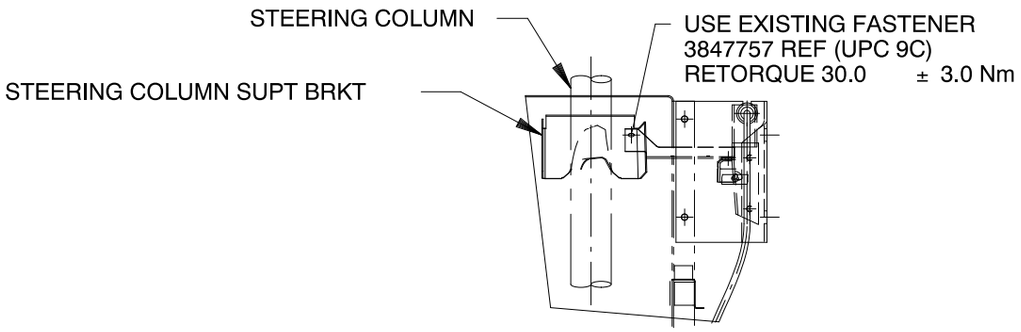
Be sure to add coolant to system after adding capacity to system (heaters).

If a heater is installed on the vehicle, a bleeder valve must be added to the heater return line at the heater in the return line to the engine, valve must be at this point since it is the highest point in the system. The purpose for the bleeder is to bleed air from the system after the heater and lines are installed. Failing to do so can cause water pump seal damage.

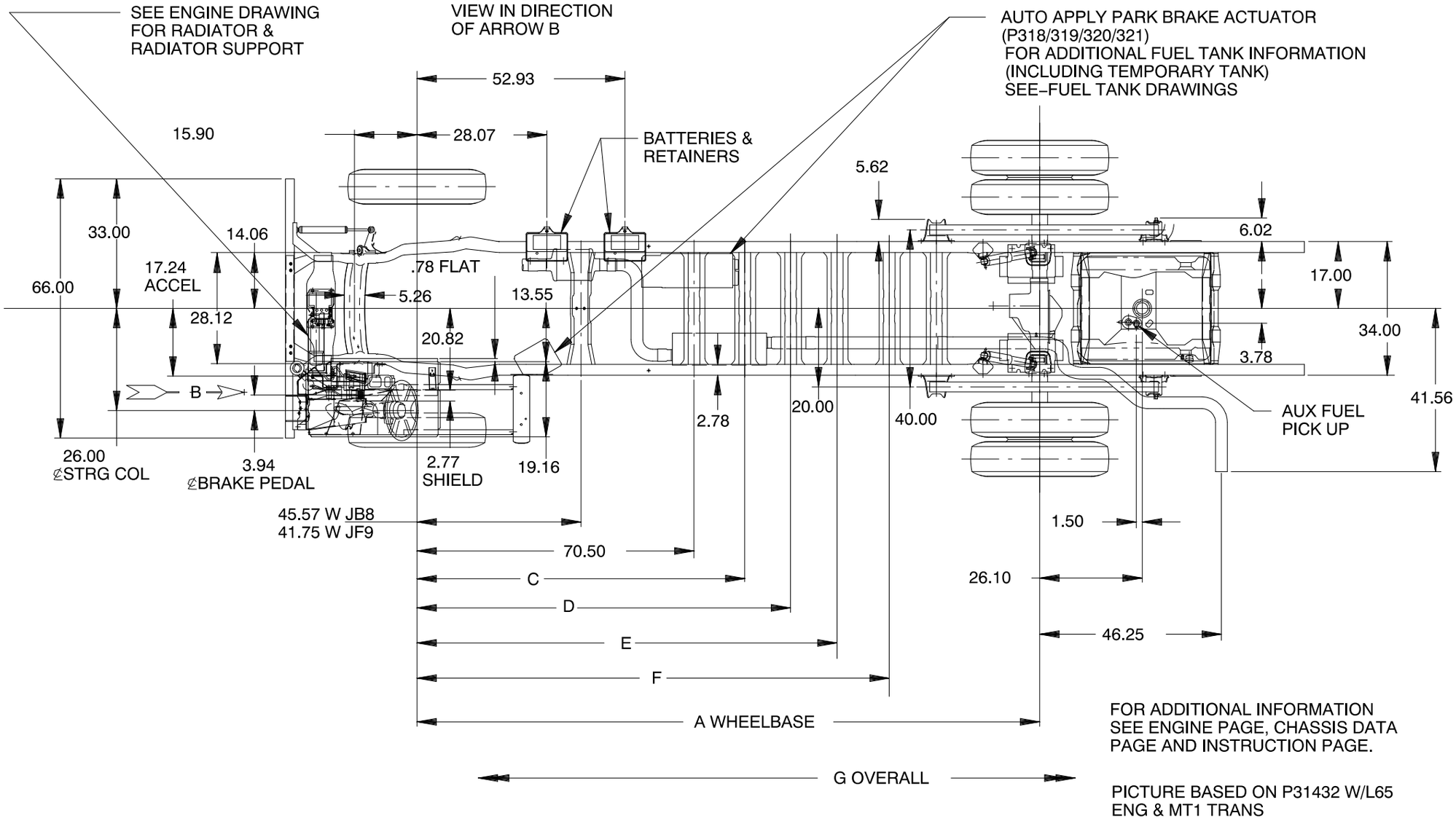
Proper bleed procedure are as follows:

1. Open bleeder valve and fill cooling system with coolant until coolant exits valve.
2. Close valve and continue filling system until full.
3. With radiator cap off, start engine and run for approximately two minutes at medium RPM.
4. Shut engine off, open bleeder valve and fill system as above and run again for two minutes.
5. Shut engine off, top off coolant and install radiator cap.
6. Check for leaks at connections.

P 30032 General Arrangement, Diesel Engine, Option L65, 6.5L Turbo HO



DIM	311	314	318	319	320	321
A	137.00	158.50	178.00	190.00	208.00	228.00
C	———	93.50	105.00	93.50	93.50	93.50
D	———	———	———	117.00	135.00	135.00
E	110.70	132.20	151.70	163.70	181.70	150.00
F	———	———	———	———	———	173.00
G	234.28	259.34	317.46	329.46	347.46	367.46



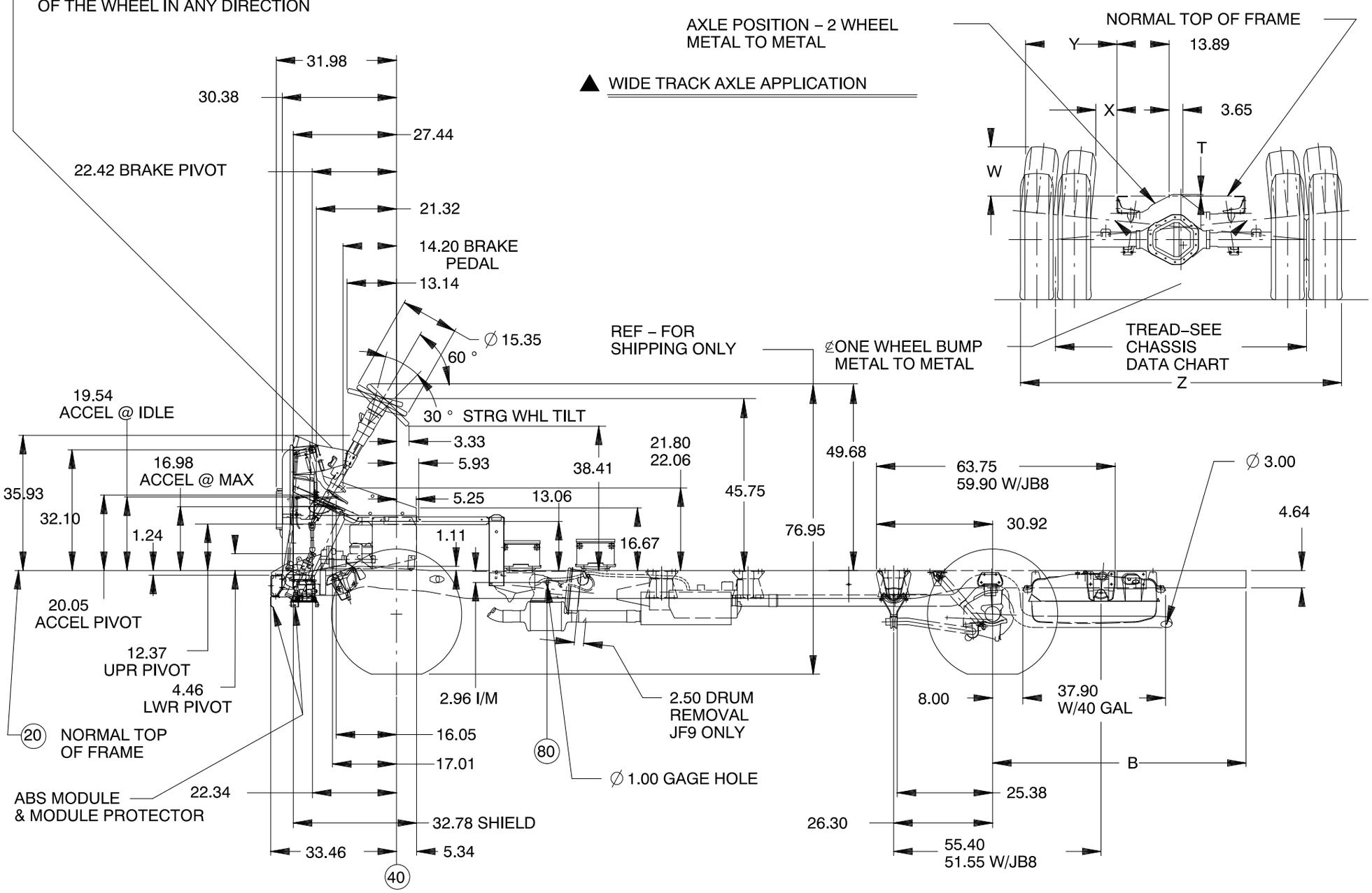
P 30032 General Arrangement, Diesel Engine, Option L65, 6.5L Turbo HO

	BRAKE SYS	TIRE SIZE	WHEEL	T	W	X	Y	Z
	JF9	225/70R19.5	DUAL	.46	11.66	6.40	23.56	85.04
▲	JF9	225/70R19.5	DUAL	.46	11.88	9.50	26.66	91.24
	JB8	7.50R16	DUAL	.38	11.50	4.10	23.78	83.00

STEERING COLUMN & BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY INSTRUMENT PANEL STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 IN. WITH 100 LBS. LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIRECTION

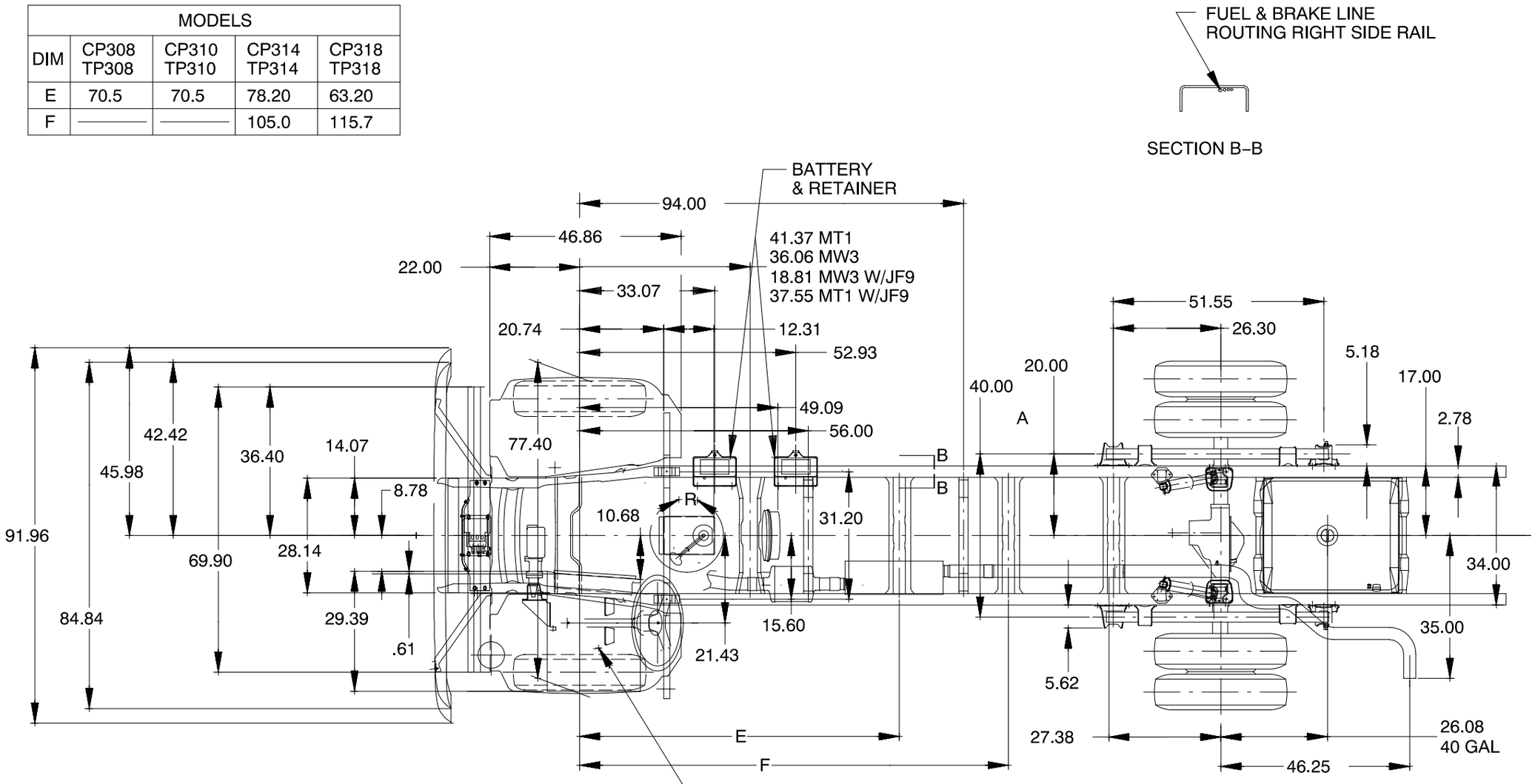
AXLE POSITION – 2 WHEEL METAL TO METAL

▲ WIDE TRACK AXLE APPLICATION



P 30042 General Arrangement, Diesel Engine, Option L57, 6.5L HO w/FL6 Independent Front Suspension

MODELS				
DIM	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
E	70.5	70.5	78.20	63.20
F	———	———	105.0	115.7



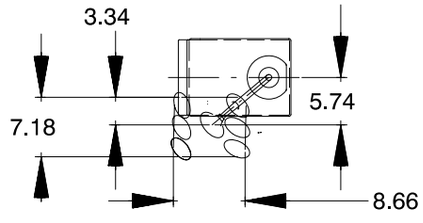
PICTURE BASED ON P31442 & L57 & FL6
AND DUAL 8R19.5 TIRE SIZE

FOR ADDITIONAL INFORMATION
SEE CHASSIS DATA PAGE

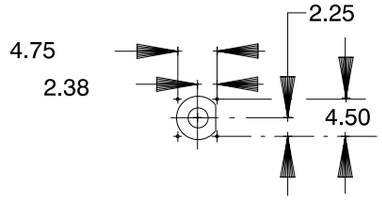
NOTE: CLEARANCE SHOULD BE PROVIDED FOR THE TIRE IN FULL UPWARD TRAVEL AND FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQUEST.

WHEN VEHICLE IS STORED FOR LONG PERIODS, CLUTCH PEDAL LEVER MUST BE BLOCKED DISENGAGED.

CAUTION:
FLOOR TO BE POSITIONED SO THAT
IT WILL NOT INTERFERE WITH
PEDALS IN DEPRESSED POSITION

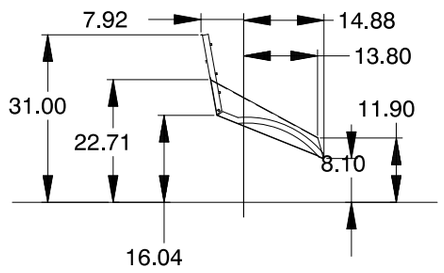


VIEW IN CIRCLE R
WITH ARTICULATION PATTERN



TRANS SHIFT LEVER BOOT TO
CAB FLOOR BOLT PATTERN

P 30042 General Arrangement, Diesel Engine, Option L57, 6.5L HO w/FL6 Independent Front Suspension

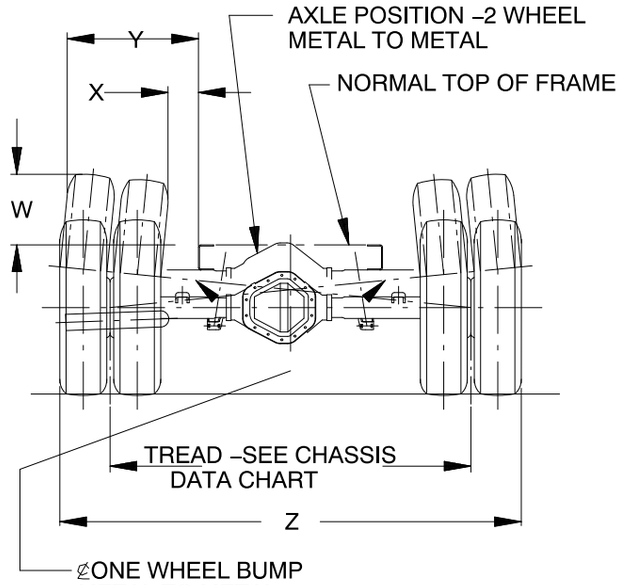


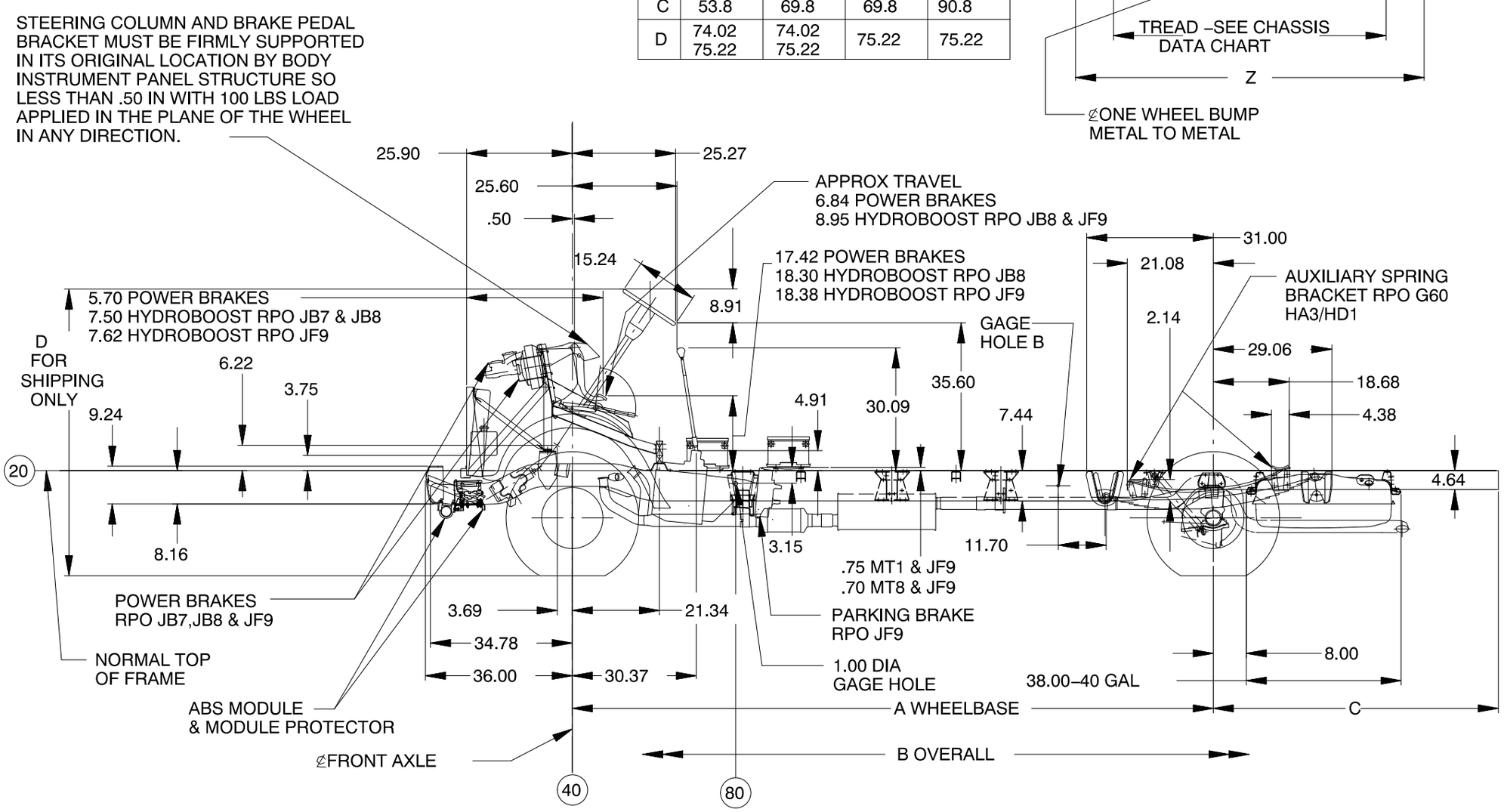
NORMAL TOP OF FRAME

SIDE VIEW – DASH AND TOE PANEL

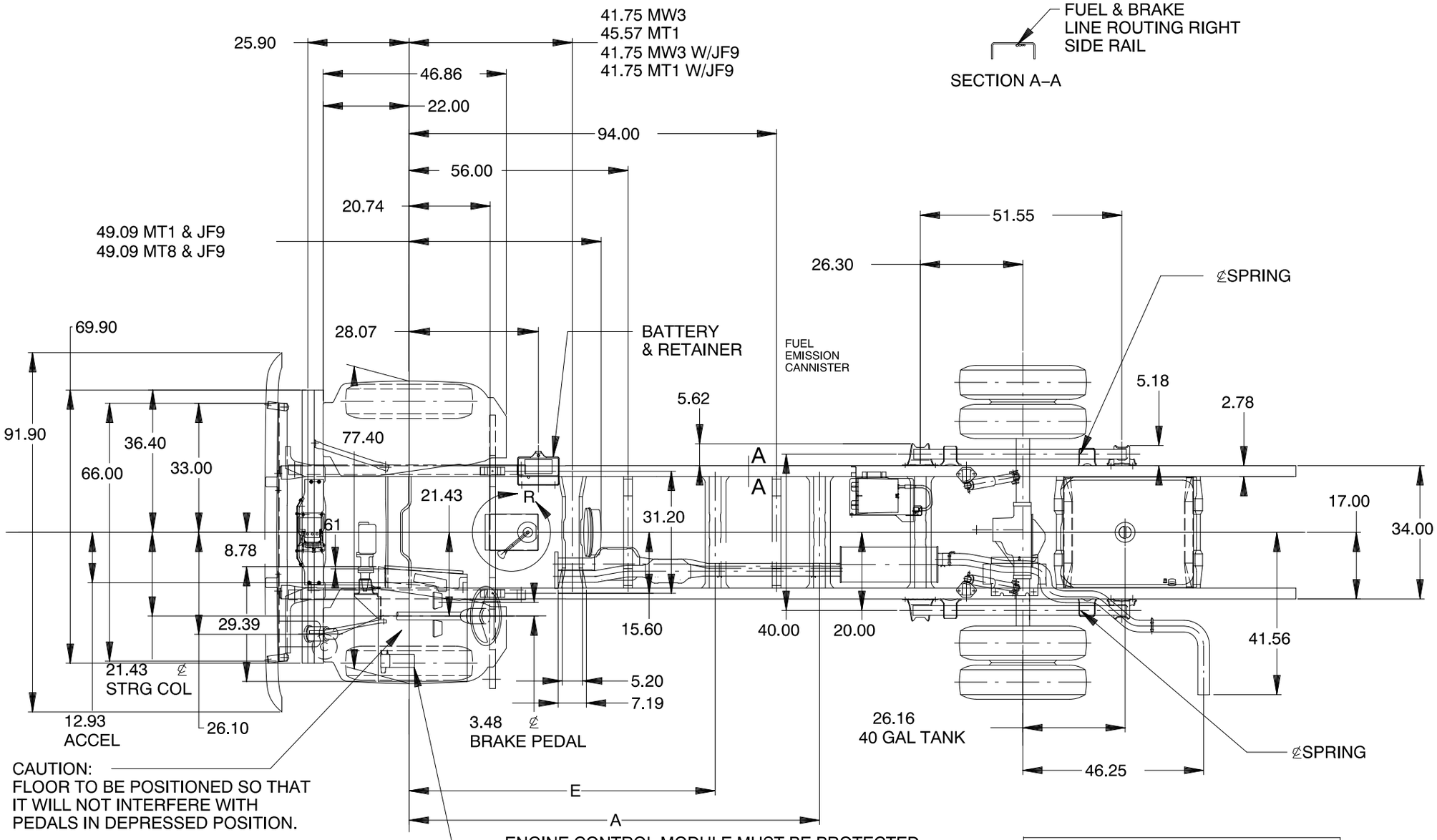
TIRE SIZE	WHEEL	W	X	Y	Z
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.48	85.60

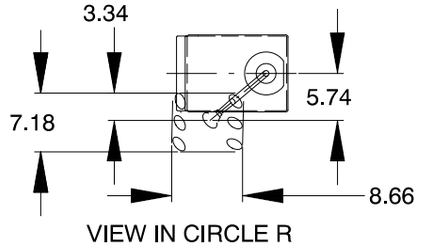
	MODELS			
DIM	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	125.0	133.0	157.0	178.0
B	214.8	238.8	262.8	304.8
C	53.8	69.8	69.8	90.8
D	74.02 75.22	74.02 75.22	75.22	75.22



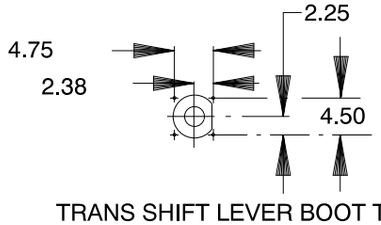


P 30042 General Arrangement, Gas Engine, Option L31, 5.7L V8 w/FK4, I-Beam Front Suspension





VIEW IN CIRCLE R
WITH ARTICULATION PATTERN

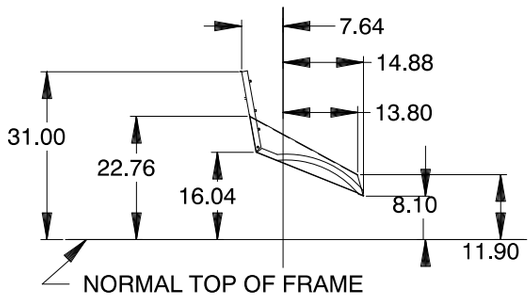


TRANS SHIFT LEVER BOOT TO
CAB FLOOR BOLT PATTERN

MODELS				
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	———	———	104.98	105.0
E	70.5	70.5	78.2	63.2

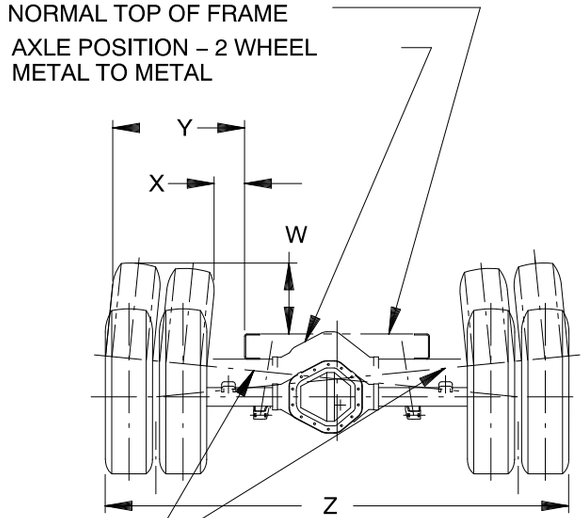
PICTURE BASED ON P31442 WITH L31 & FK4
AND DUAL 8R19.5 TIRES

P 30042 General Arrangement, Gas Engine, Option L31, 5.7L V8 w/FK4 I–Beam Front Suspension, Option FK4



SIDE VIEW – DASH AND TOE PANEL

TIRE SIZE	WHEEL	W	X	Y	Z
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.48	85.60

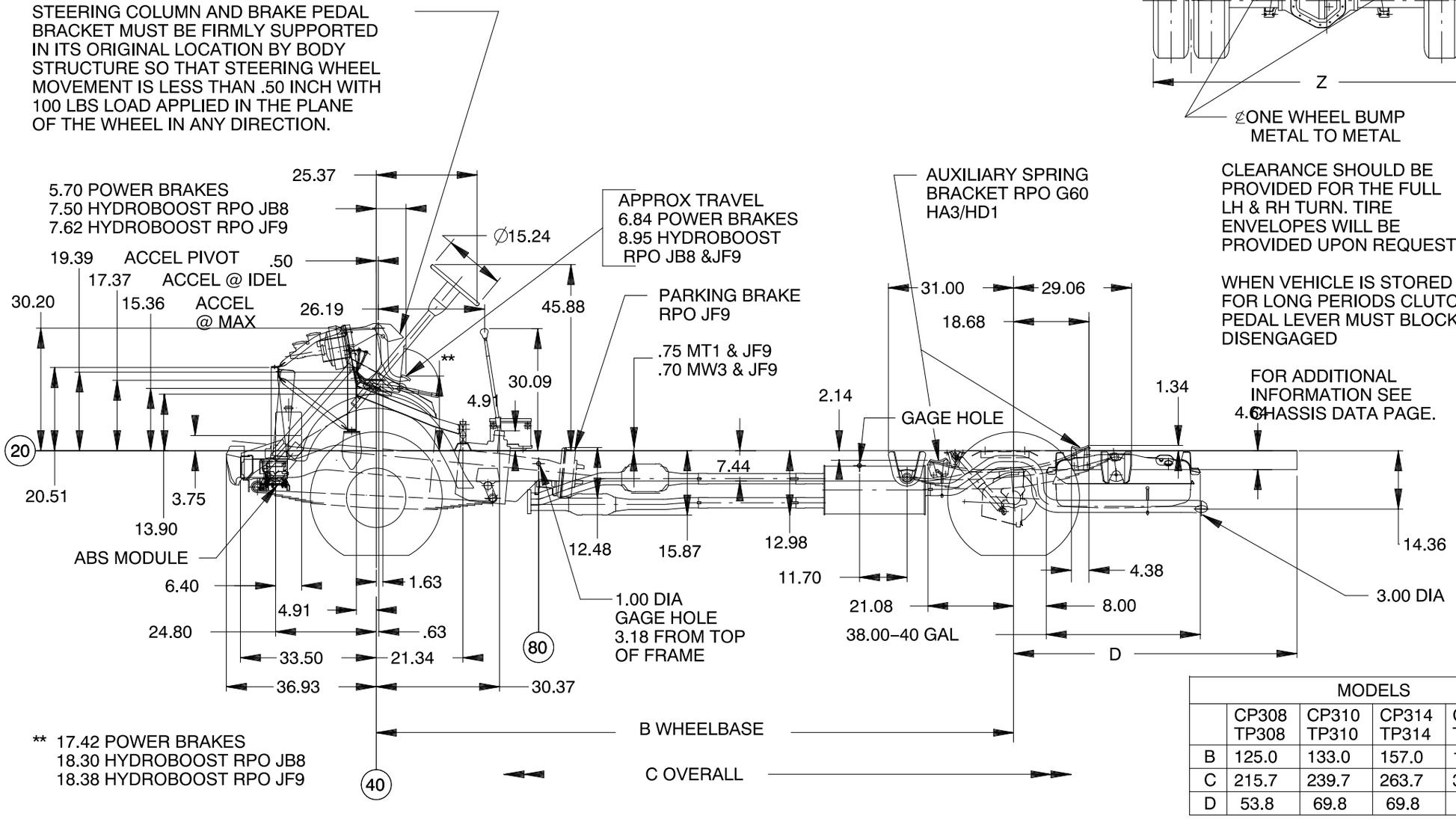


STEERING COLUMN AND BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 INCH WITH 100 LBS LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIRECTION.

CLEARANCE SHOULD BE PROVIDED FOR THE FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQUEST.

WHEN VEHICLE IS STORED FOR LONG PERIODS CLUTCH PEDAL LEVER MUST BLOCKED DISENGAGED

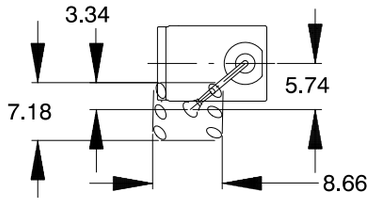
FOR ADDITIONAL INFORMATION SEE CHASSIS DATA PAGE.



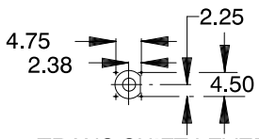
** 17.42 POWER BRAKES
18.30 HYDROBOOST RPO JB8
18.38 HYDROBOOST RPO JF9

	MODELS			
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
B	125.0	133.0	157.0	178.0
C	215.7	239.7	263.7	305.7
D	53.8	69.8	69.8	90.8

P 30042 General Arrangement, Gas Engine, Option L31, 5.7L V8, w/FL6 Independent Front Suspension

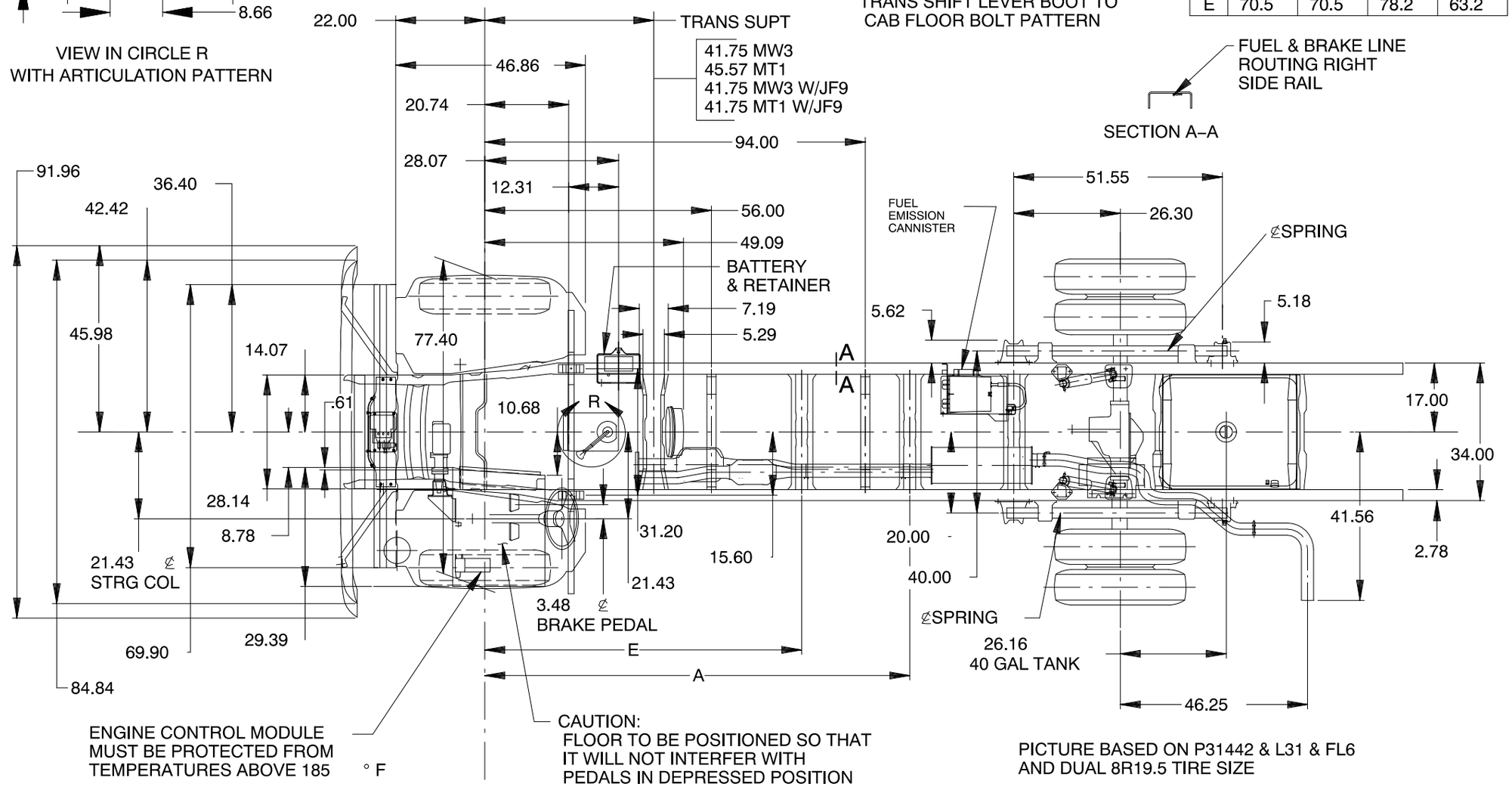


VIEW IN CIRCLE R
WITH ARTICULATION PATTERN



TRANS SHIFT LEVER BOOT TO
CAB FLOOR BOLT PATTERN

MODELS				
DIM	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	———	———	105.0	115.7
E	70.5	70.5	78.2	63.2



SECTION A–A

ENGINE CONTROL MODULE
MUST BE PROTECTED FROM
TEMPERATURES ABOVE 185 ° F

CAUTION:
FLOOR TO BE POSITIONED SO THAT
IT WILL NOT INTERFER WITH
PEDALS IN DEPRESSED POSITION

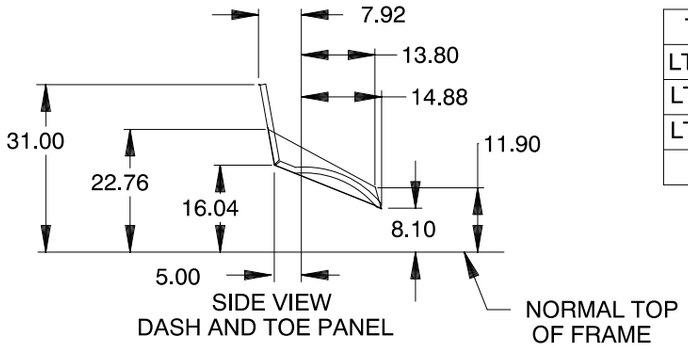
PICTURE BASED ON P31442 & L31 & FL6
AND DUAL 8R19.5 TIRE SIZE

FOR ADDITIONAL INFORMATION
SEE CHASSIS DATA PAGE

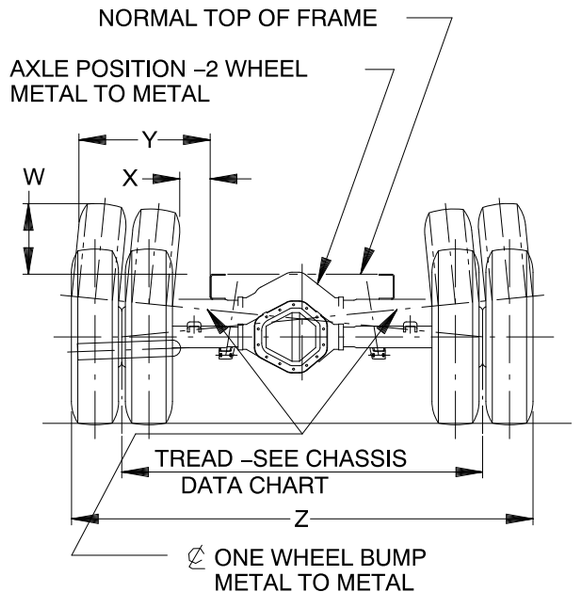
NOTE: CLEARANCE SHOULD BE PROVIDED FOR THE TIRE IN FULL UPWARD TRAVEL AND FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQUEST

WHEN VEHICLE IS STORED FOR LONG PERIODS, CLUTCH PEDAL LEVER MUST BE BLOCKED DISENGAGED.

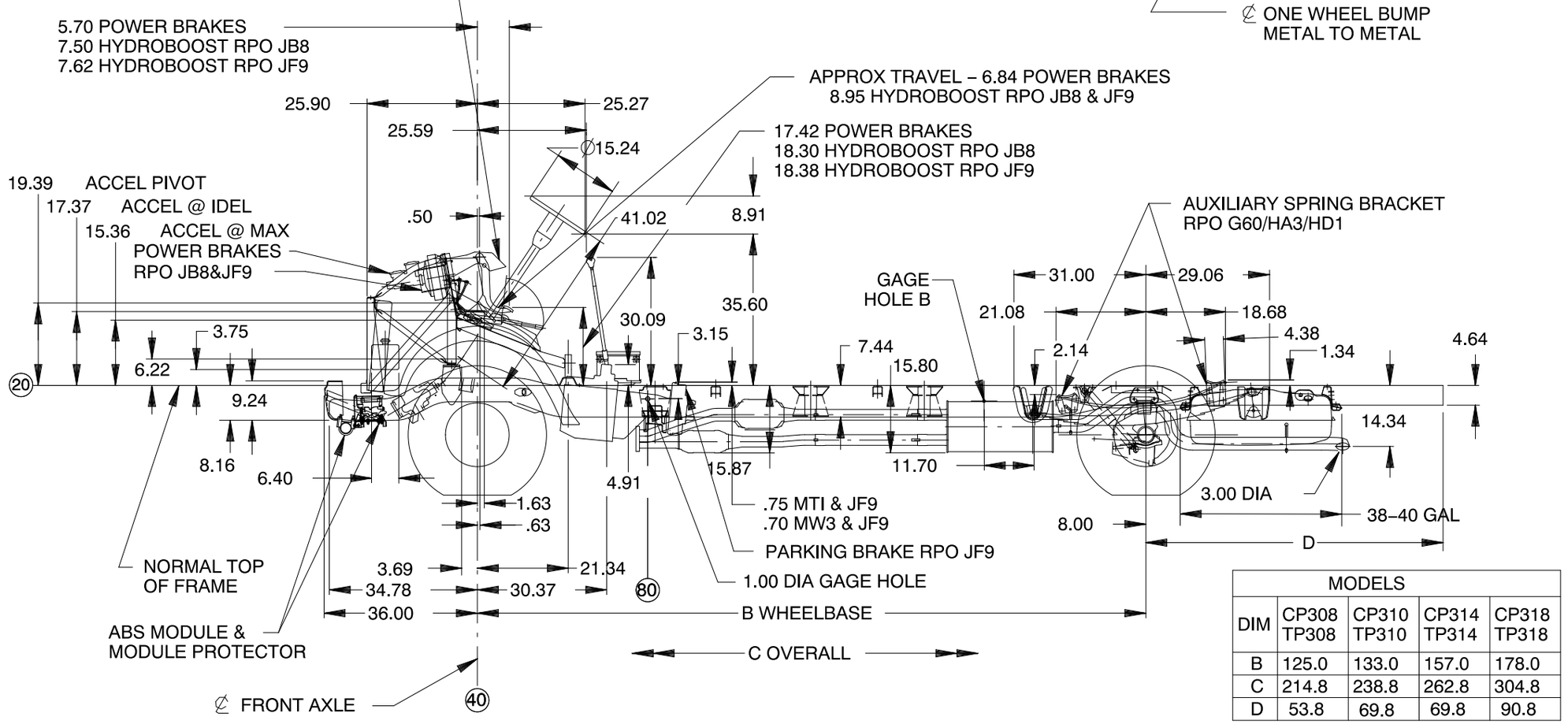
P 30042 General Arrangement, Gas Engine, Option L31, 5.7L V8, w/FL6 Independent Front Suspension



TIRE SIZE	WHEEL	W	X	Y	Z
LT225/75R16	SINGLE	9.41	9.75	14.63	75.00
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.48	85.60

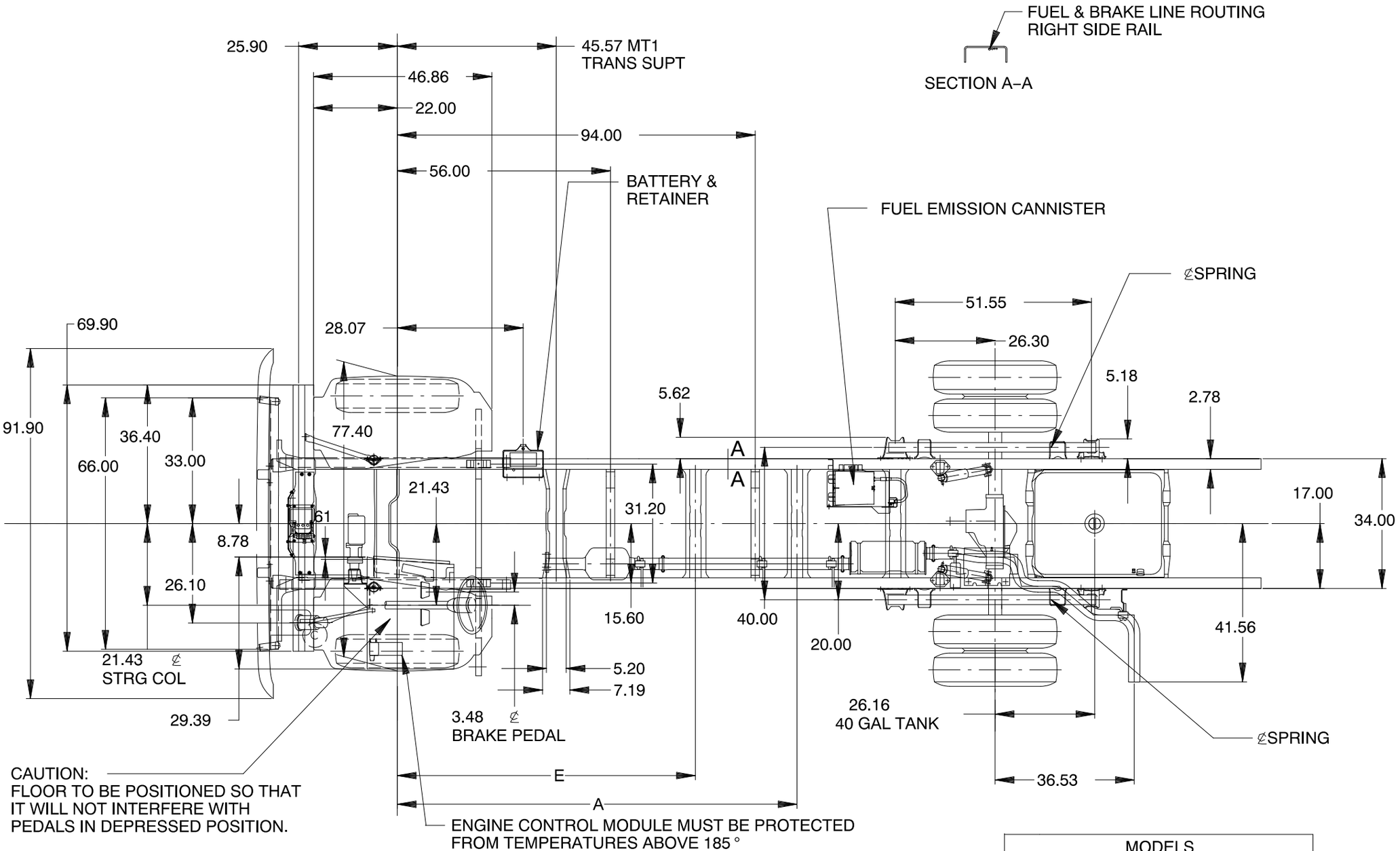


STEERING COLUMN AND BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY INSTRUMENT PANEL STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 IN WITH 100 LBS LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIRECTION.



DIM	MODELS			
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
B	125.0	133.0	157.0	178.0
C	214.8	238.8	262.8	304.8
D	53.8	69.8	69.8	90.8

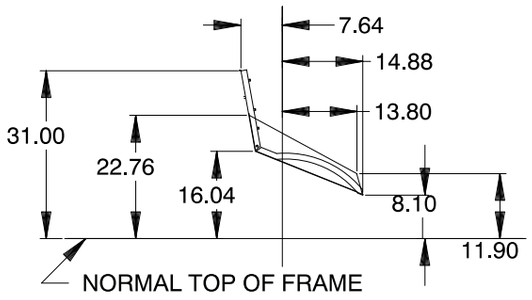
P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FK4 I–Beam Front Suspension



	MODELS			
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	———	———	104.98	105.0
E	70.5	70.5	78.2	63.2

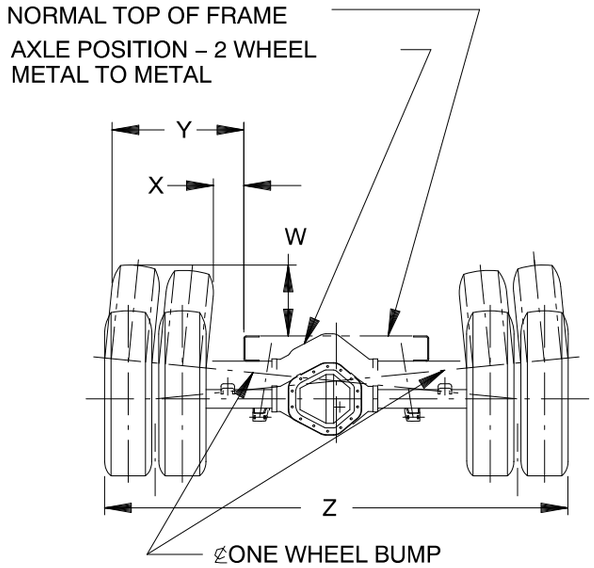
PICTURE BASED ON P31442 WITH L35 & FK4
AND DUAL 8R19.5 TIRES

P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FK4 I–Beam Front Suspension



SIDE VIEW – DASH AND TOE PANEL

TIRE SIZE	WHEEL	W	X	Y	Z
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.48	85.60
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40

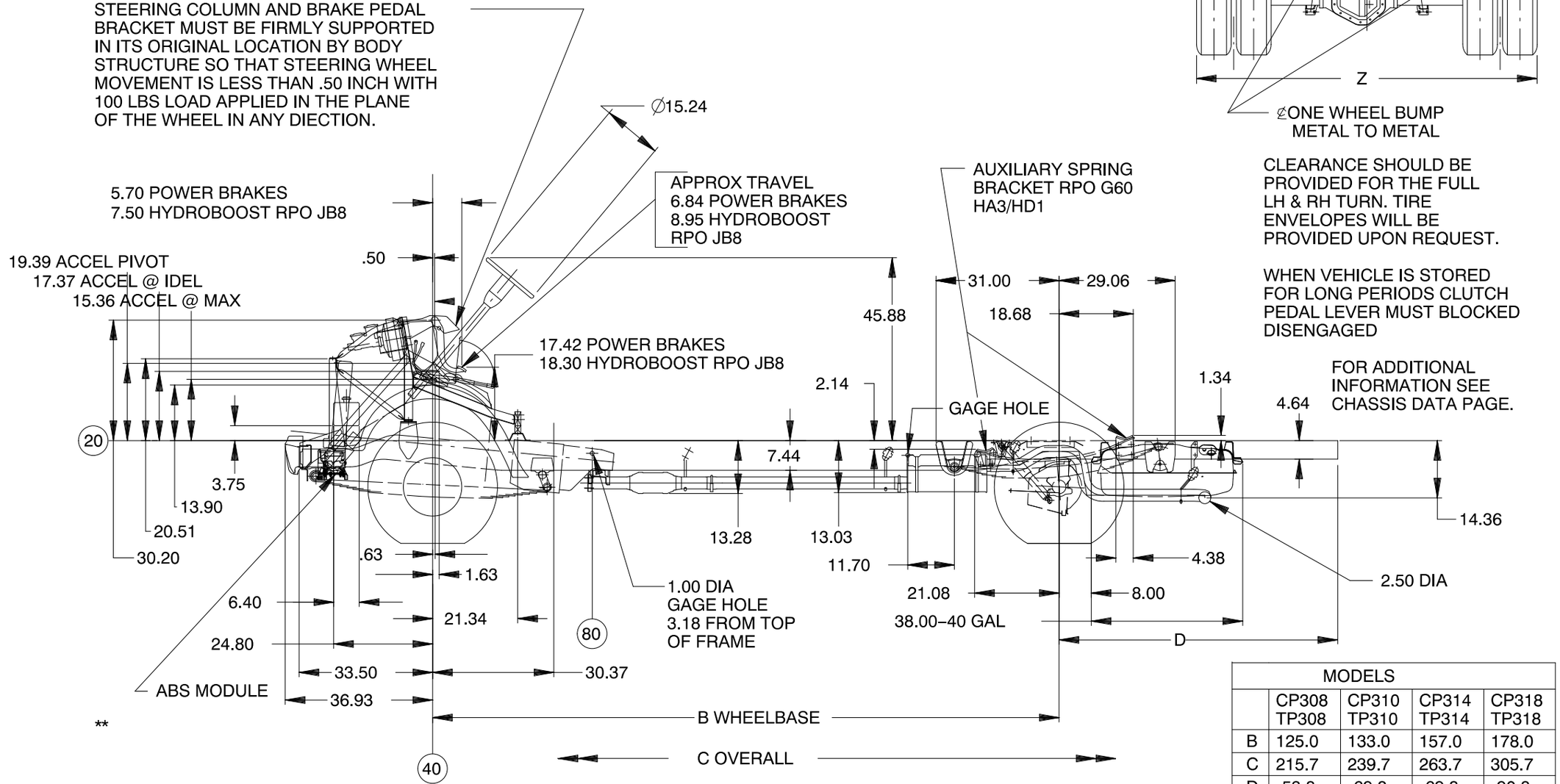


STEERING COLUMN AND BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 INCH WITH 100 LBS LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIECTION.

CLEARANCE SHOULD BE PROVIDED FOR THE FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQUEST.

WHEN VEHICLE IS STORED FOR LONG PERIODS CLUTCH PEDAL LEVER MUST BLOCKED DISENGAGED

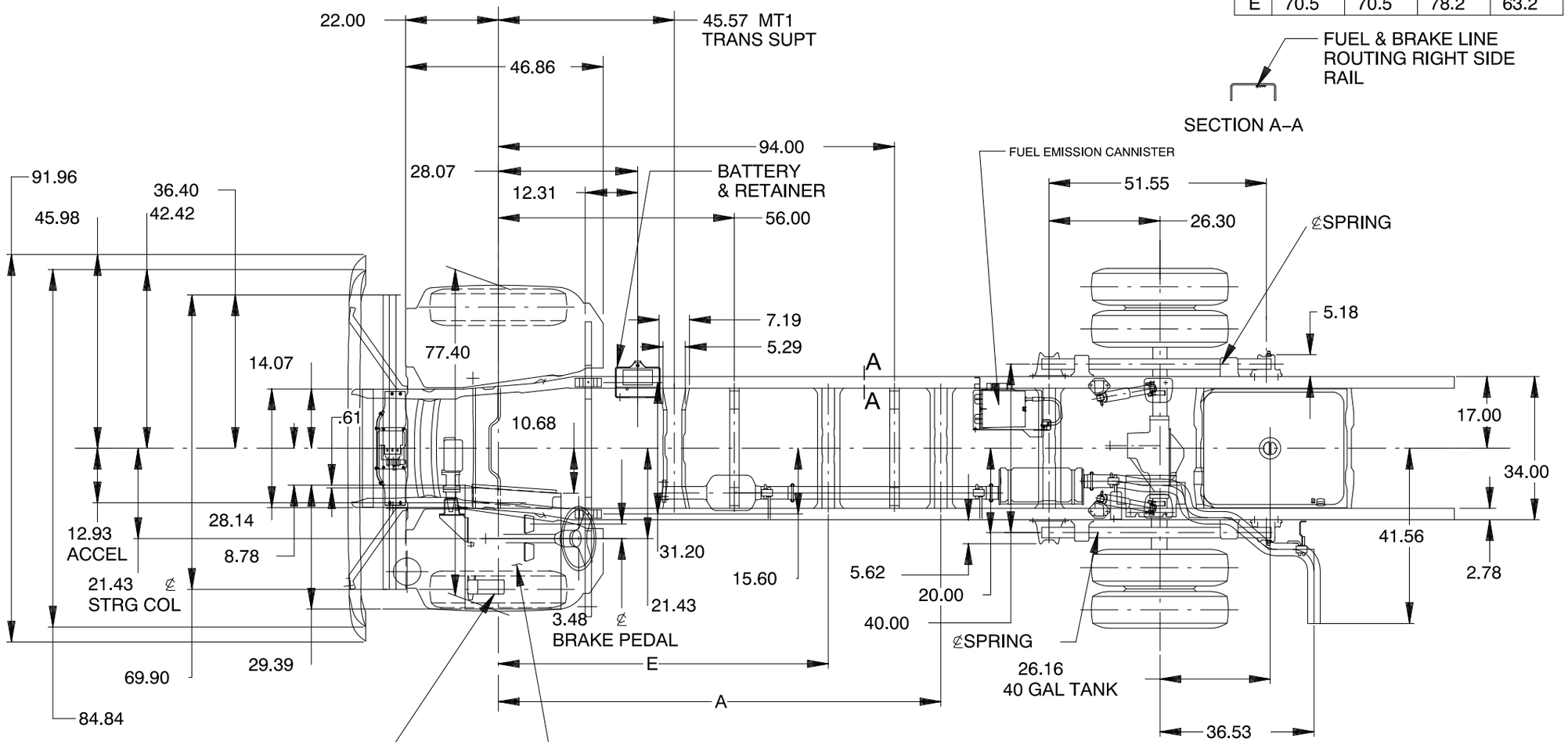
FOR ADDITIONAL INFORMATION SEE CHASSIS DATA PAGE.



MODELS				
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
B	125.0	133.0	157.0	178.0
C	215.7	239.7	263.7	305.7
D	53.8	69.8	69.8	90.8

P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FL6 Independent Front Suspension

MODELS				
DIM	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	———	———	105.0	115.7
E	70.5	70.5	78.2	63.2



ENGINE CONTROL MODULE
MUST BE PROTECTED FROM
TEMPERATURES ABOVE 185 ° F

CAUTION:
FLOOR TO BE POSITIONED SO THAT
IT WILL NOT INTERFER WITH
PEDALS IN DEPRESSED POSITION

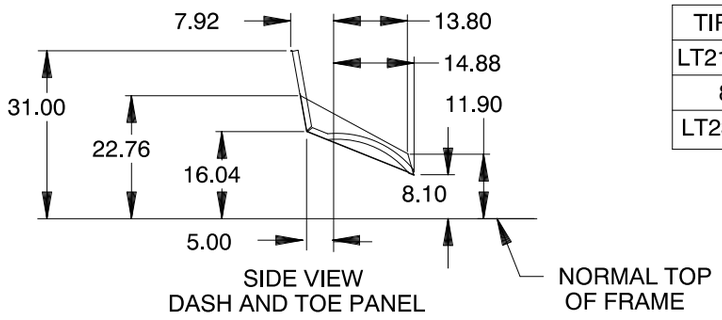
PICTURE BASED ON P31442 & L35 & FL6
AND DUAL 8R19.5 TIRE SIZE

FOR ADDITIONAL INFORMATION
SEE CHASSIS DATA PAGE

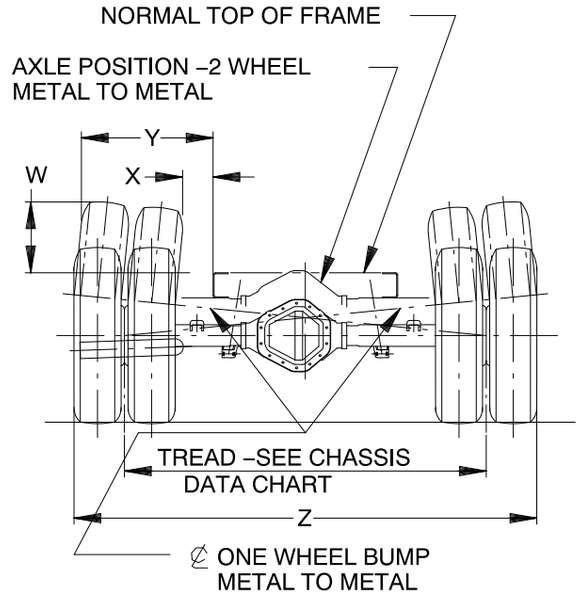
NOTE: CLEARANCE SHOULD BE PROVIDED FOR
THE TIRE IN FULL UPWARD TRAVEL AND FULL
LH & RH TURN. TIRE ENVELOPES WILL BE
PROVIDED UPON REQUEST

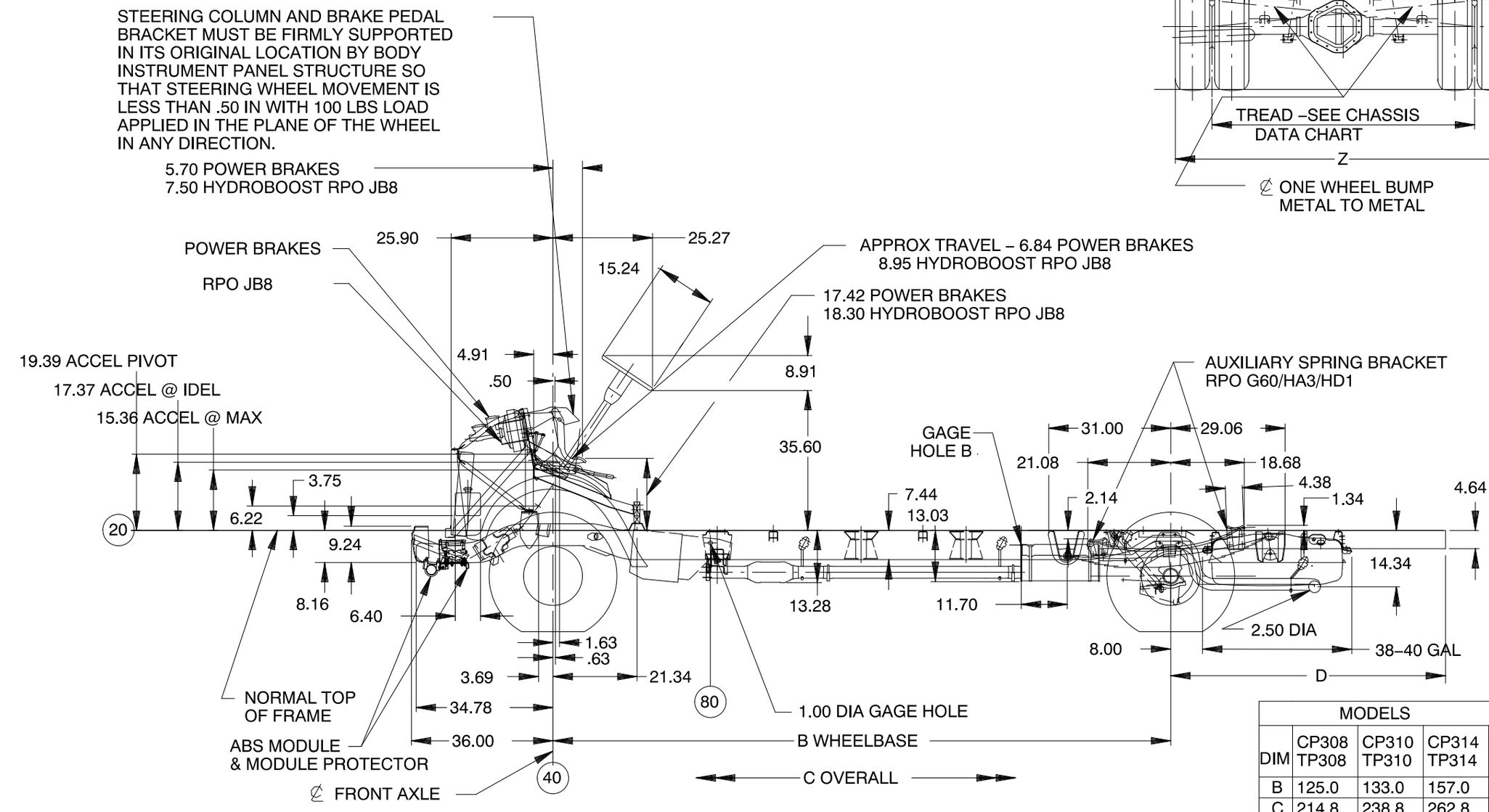
WHEN VEHICLE IS STORED FOR LONG PERIODS,
CLUTCH PEDAL LEVER MUST BE BLOCKED
DISENGAGED.

P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FL6 Independent Front Suspension



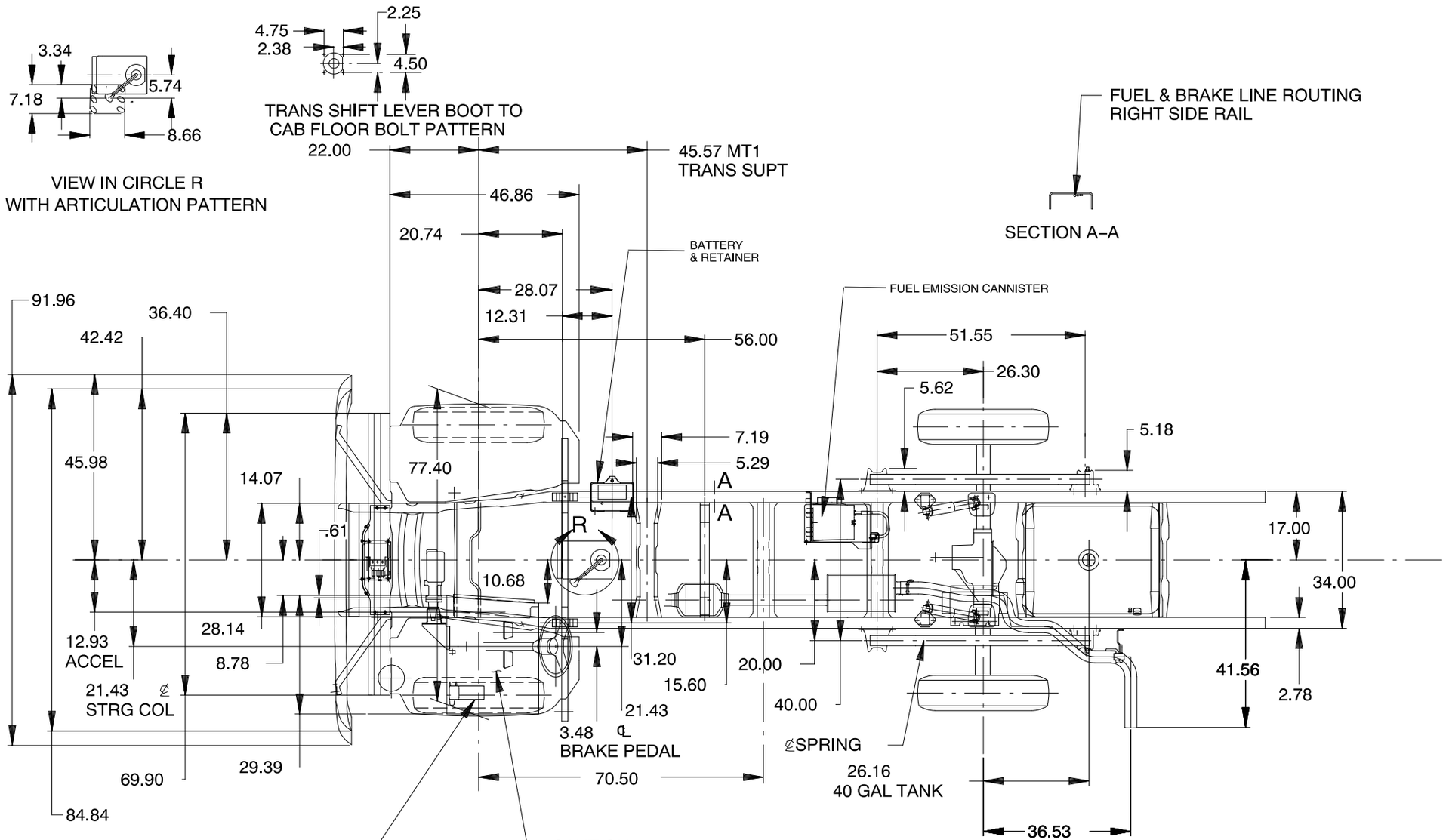
TIRE SIZE	WHEEL	W	X	Y	Z
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.60	85.60
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40





MODELS				
DIM	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
B	125.0	133.0	157.0	178.0
C	214.8	238.8	262.8	304.8
D	53.8	69.8	69.8	90.8

P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FL5/FL6 Independent Front Suspension



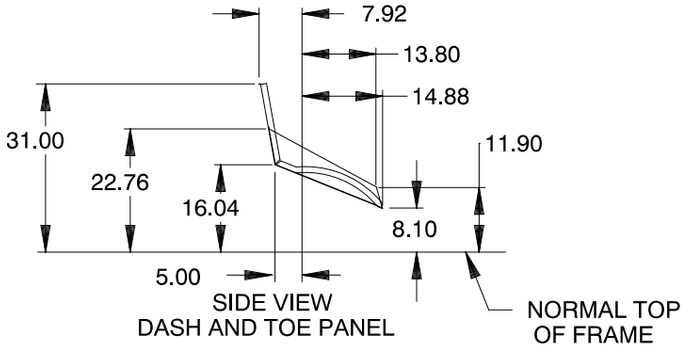
PICTURE BASED ON P30542 & L35 & FL5
AND SINGLE LT225/75R16 TIRE SIZE

FOR ADDITIONAL INFORMATION
SEE CHASSIS DATA PAGE

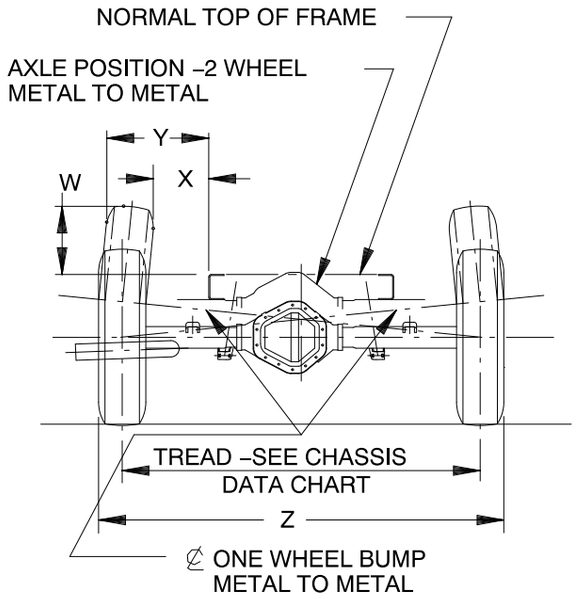
NOTE: CLEARANCE SHOULD BE PROVIDED FOR THE TIRE IN FULL UPWARD TRAVEL AND FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQU

WHEN VEHICLE IS STORED FOR LONG PERIODS, CLUTCH PEDAL LEVER MUST BE BLOCKED DISENGAGED.

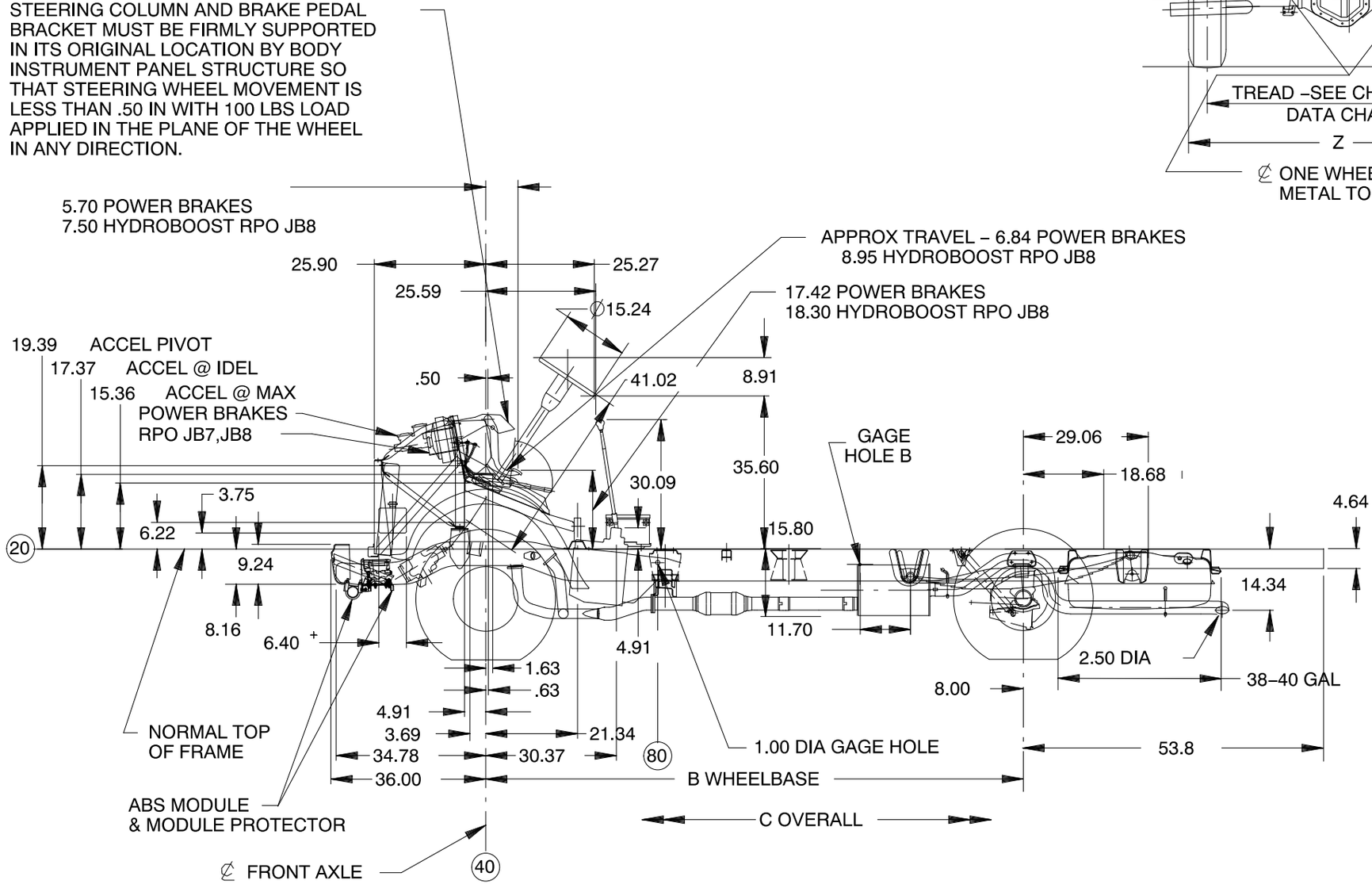
P 30042 General Arrangement, Gas Engine, Option L35, 4.3L V6 w/FL5/FL6 Independent Front Suspension



TIRE SIZE	W	X	Y	Z
LT225/75R16	9.34	10.00	14.38	74.52
LT235/85R16	9.51	9.86	14.13	74.79

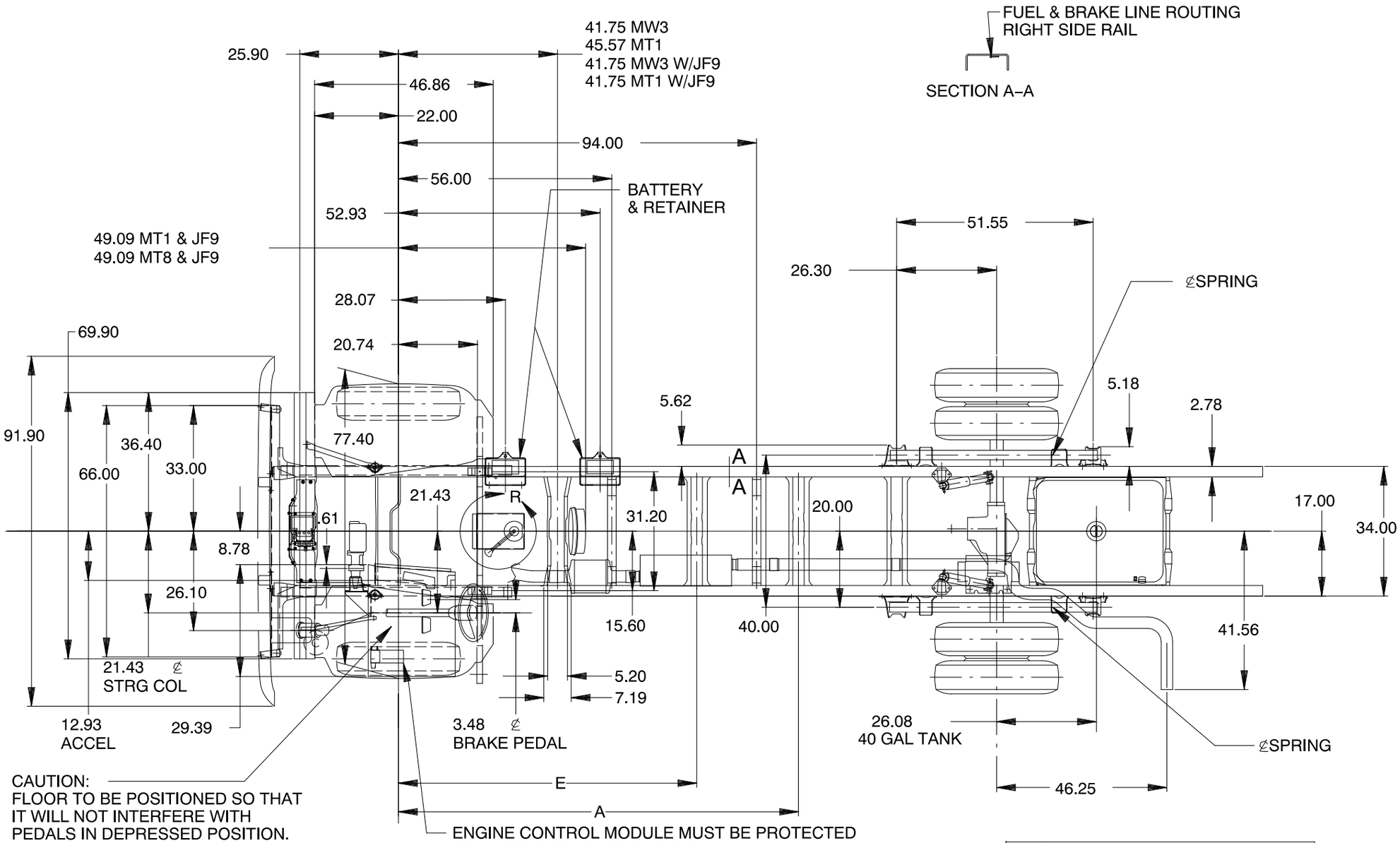


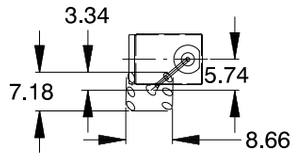
STEERING COLUMN AND BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY INSTRUMENT PANEL STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 IN WITH 100 LBS LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIRECTION.



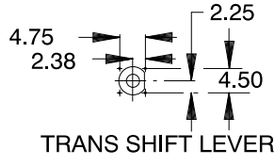
MODELS		
DIM	CP305 TP305	CP308 TP308
B	110.0	125.0
C	199.8	214.8

P 30042 General Arrangement, Diesel Engine, Option L57, 6.5L HO w/FK4/FK5 I–Beam Front Suspension





VIEW IN CIRCLE R
WITH ARTICULATION PATTERN

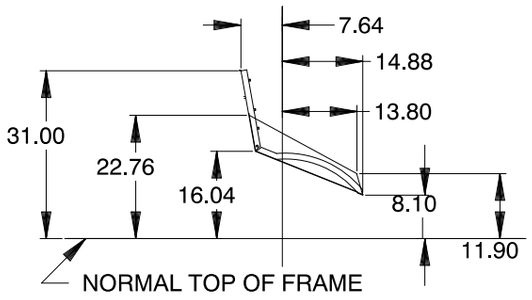


TRANS SHIFT LEVER BOOT TO
CAB FLOOR BOLT PATTERN

	MODELS			
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
A	———	———	104.98	105.0
E	70.5	70.5	78.2	63.2

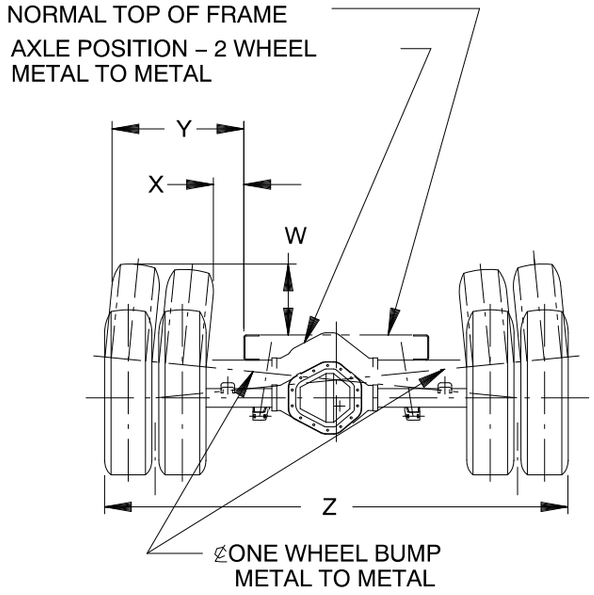
PICTURE BASED ON P31442 WITH L57 & FK4
AND DUAL 8R19.5 TIRES

P 30042 General Arrangement, Diesel Engine, Option L57, 6.5L HO w/FK4/FK5 I–Beam Front Suspension

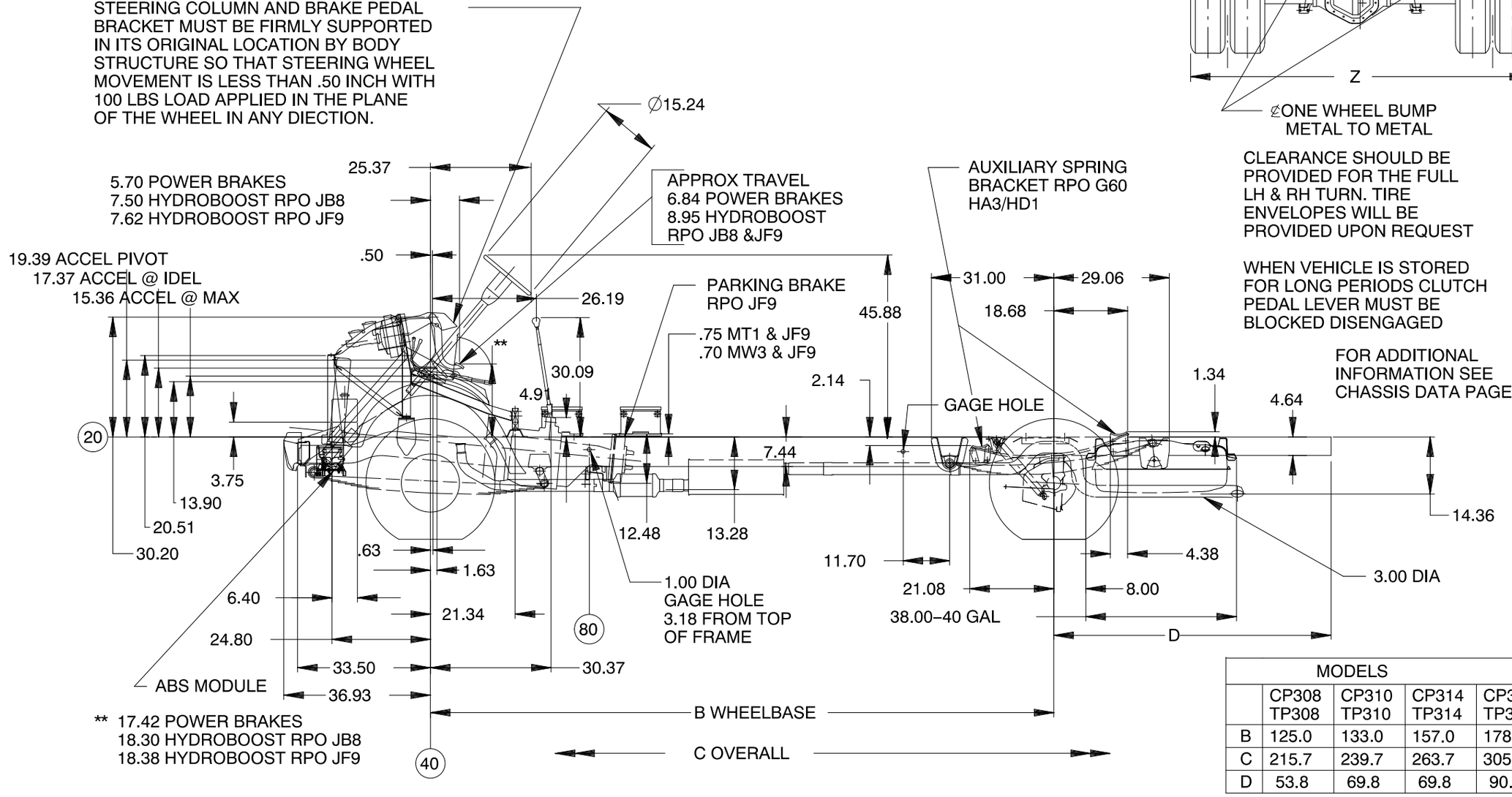


SIDE VIEW – DASH AND TOE PANEL

TIRE SIZE	WHEEL	W	X	Y	Z
LT215/85R16	DUAL	10.40	4.36	23.50	82.72
8R19.5	DUAL	10.83	5.92	24.48	85.60
LT235/85R16	SINGLE	11.16	9.78	14.56	75.40



STEERING COLUMN AND BRAKE PEDAL BRACKET MUST BE FIRMLY SUPPORTED IN ITS ORIGINAL LOCATION BY BODY STRUCTURE SO THAT STEERING WHEEL MOVEMENT IS LESS THAN .50 INCH WITH 100 LBS LOAD APPLIED IN THE PLANE OF THE WHEEL IN ANY DIECTION.



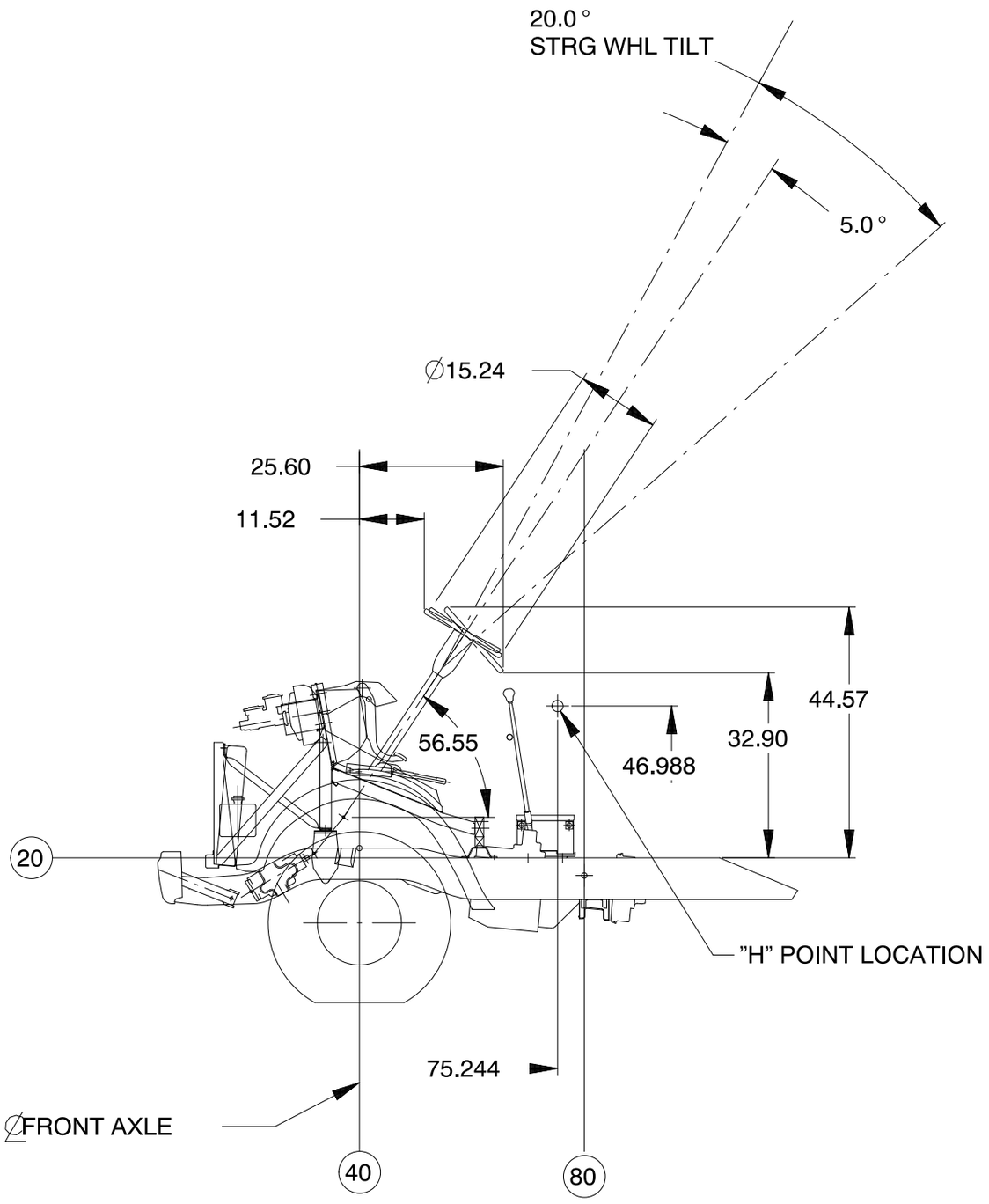
CLEARANCE SHOULD BE PROVIDED FOR THE FULL LH & RH TURN. TIRE ENVELOPES WILL BE PROVIDED UPON REQUEST

WHEN VEHICLE IS STORED FOR LONG PERIODS CLUTCH PEDAL LEVER MUST BE BLOCKED DISENGAGED

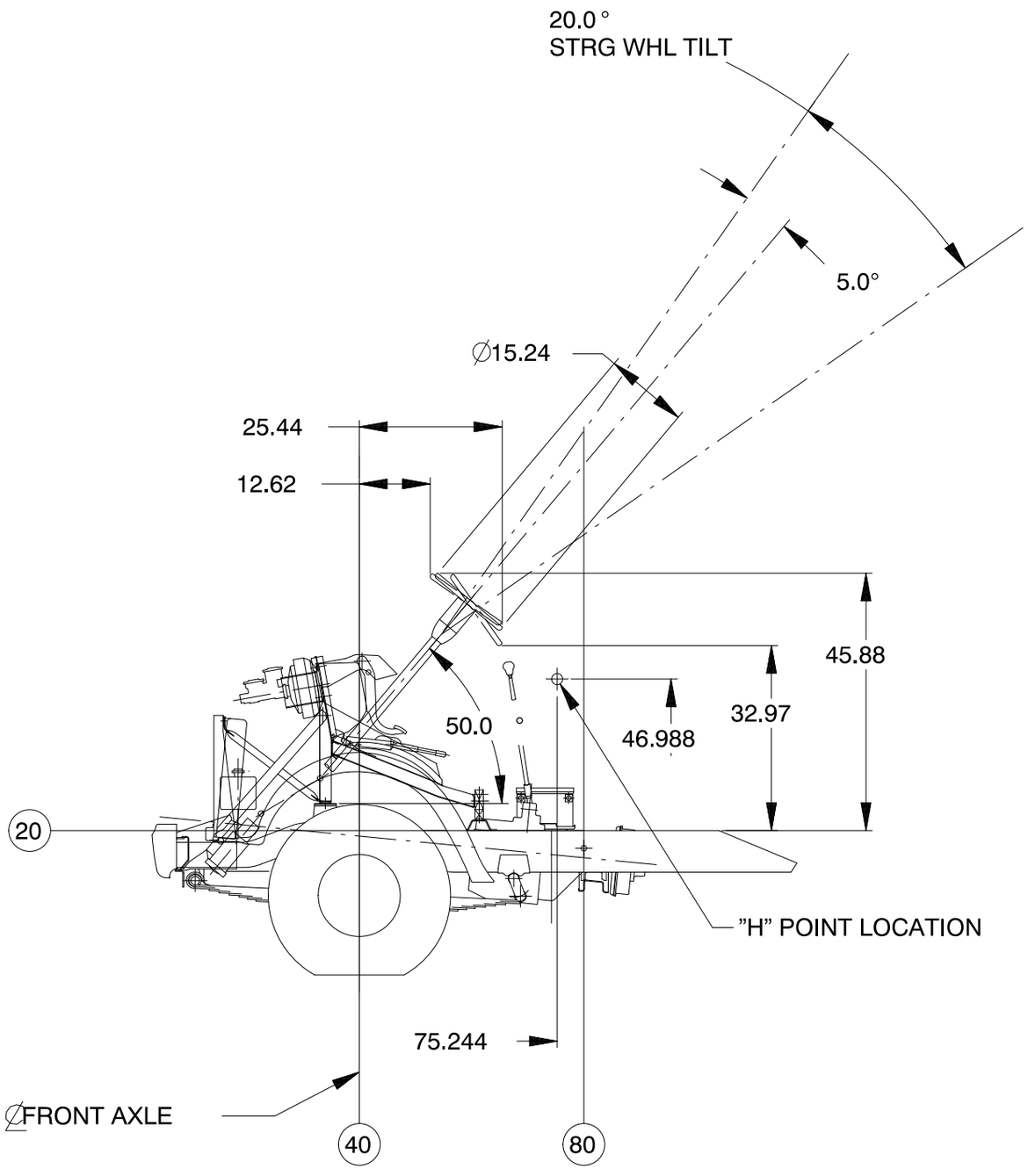
FOR ADDITIONAL INFORMATION SEE CHASSIS DATA PAGE

MODELS				
	CP308 TP308	CP310 TP310	CP314 TP314	CP318 TP318
B	125.0	133.0	157.0	178.0
C	215.7	239.7	263.7	305.7
D	53.8	69.8	69.8	90.8

P 30042 General Arrangement, H Point Locations w/I–Beam Front Suspension Options FK4/FK5, without I–Beam Front Suspension, Options FL5/FL6/FL7

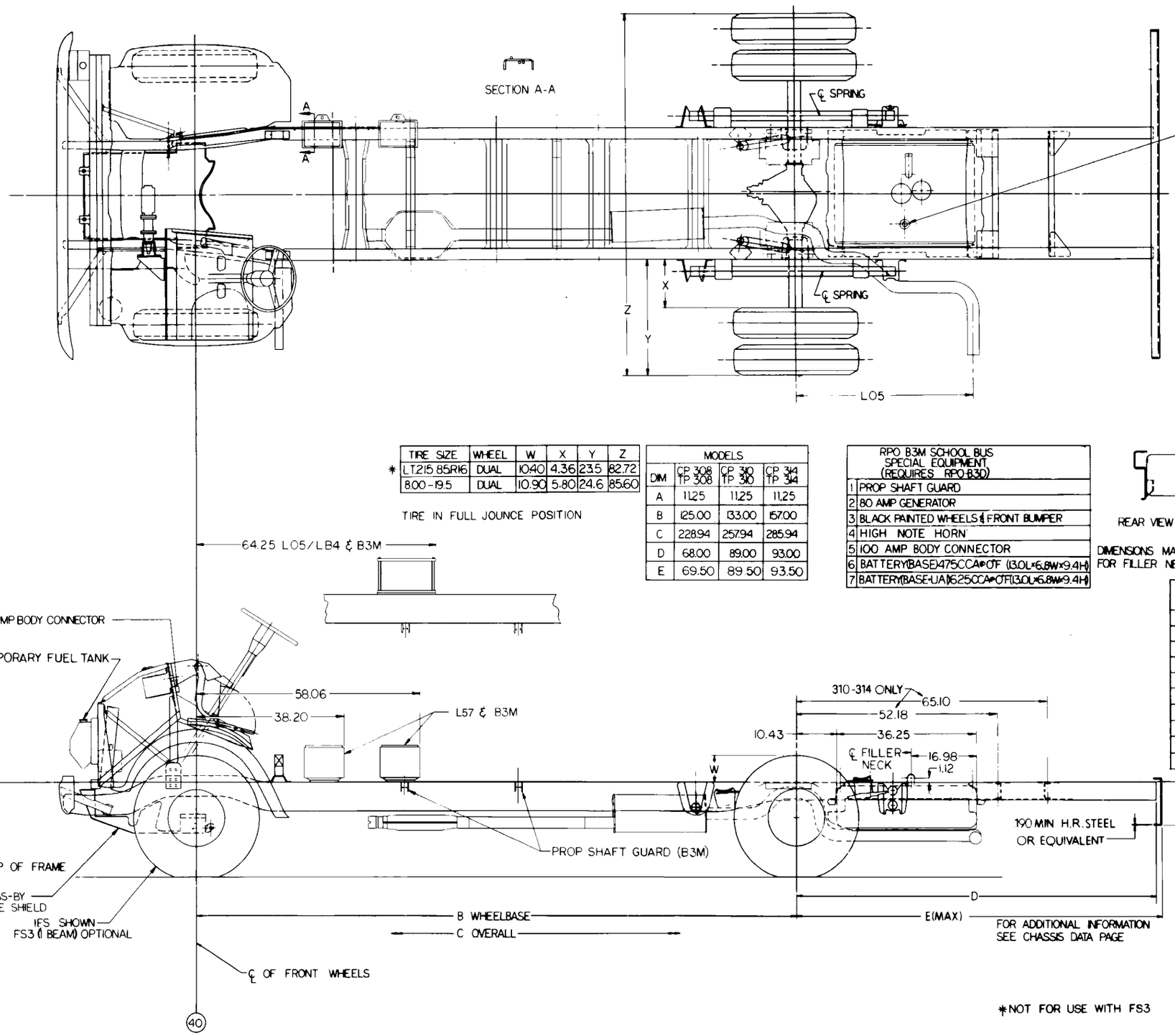


30042 & FL5/FL6/FL7



30042 & FK4/FK5

P 30042 General Arrangement, School Bus Application, Option B3D/B3M



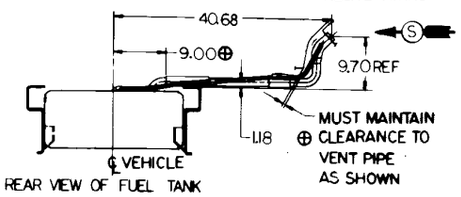
TIRE SIZE	WHEEL	W	X	Y	Z
* LT215 85R16	DUAL	104.0	4.36	23.5	82.72
8.00-19.5	DUAL	10.90	5.80	24.6	85.60

TIRE IN FULL JOUNCE POSITION

DIM	MODELS CP 308 TP 308	CP 310 TP 310	CP 314 TP 314
A	11.25	11.25	11.25
B	125.00	133.00	157.00
C	228.94	257.94	285.94
D	68.00	89.00	93.00
E	69.50	89.50	93.50

RPO B3M SCHOOL BUS SPECIAL EQUIPMENT (REQUIRES RPO B3D)
1 PROP SHAFT GUARD
2 80 AMP GENERATOR
3 BLACK PAINTED WHEELS & FRONT BUMPER
4 HIGH NOTE HORN
5 100 AMP BODY CONNECTOR
6 BATTERY (BASE) 475 CCA @ 0°F (13.0L x 6.8W x 9.4H)
7 BATTERY (BASE-UA) 625 CCA @ 0°F (13.0L x 6.8W x 9.4H)

NOTE - IF SHORTER FILLER PIPE IS REQUIRED USE SUBURBAN FILLER PIPE.
GAS - 14071917
DIESEL - 14071919
FOR VIEW 'S' SEE FUEL FILLER NECK DRAWING



REAR VIEW OF FUEL TANK

DIMENSIONS MARKED THUS ⊕ ARE FOR FILLER NECK AS SHIPPED

RPO B3D SCHOOL BUS EQUIPMENT NOT SHOWN ON DRAWING	
1	4500 LB. FRONT SUSPENSION
	14,500 GVWR ONLY
2	MODEL P30042 — 11,500 LB. GVW &
	14500 LB GVW
3	BATTERY (BASE) 390 CCA @ 0°F (8.1L x 7.0W x 8.4H)
4	BATTERY (BASE-UA) 465 CCA @ 0°F (10.2L x 7.0W x 8.4H)
5	BATTERY (BASE) L57 2 REQD 500 CCA @ 0°F (10.2L 7.0W 84H)

IMPORTANT

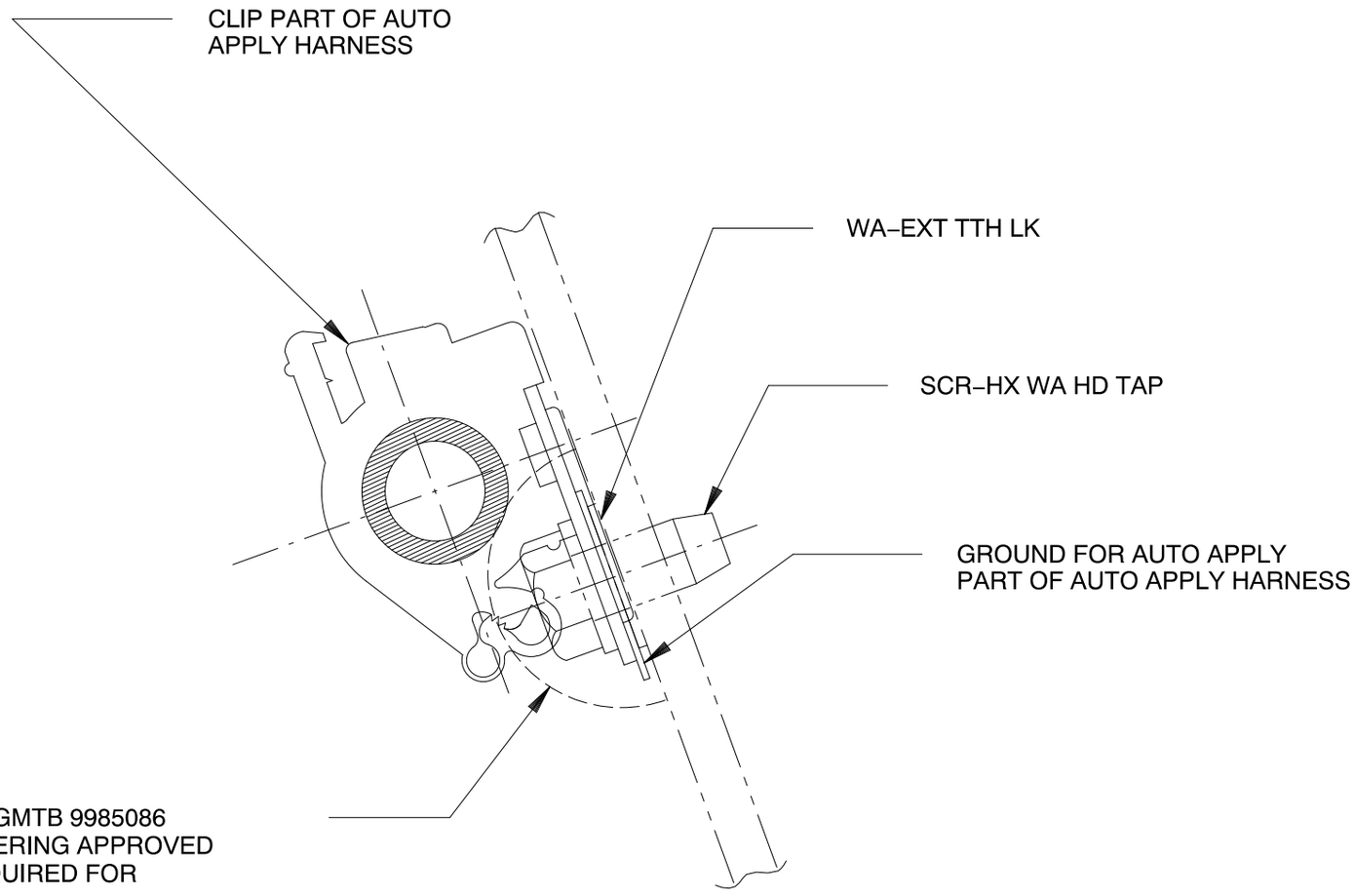
BODY BUILDER MUST LOCATE REAR BUMPER TO DIMS. A & E TO ASSURE COMPLIANCE WITH FMVSS 301 STANDARD.
REAR BUMPER AND BRACES ARE NOT PROVIDED.

PICTURE BASED ON P-31442 (RPO B3D)

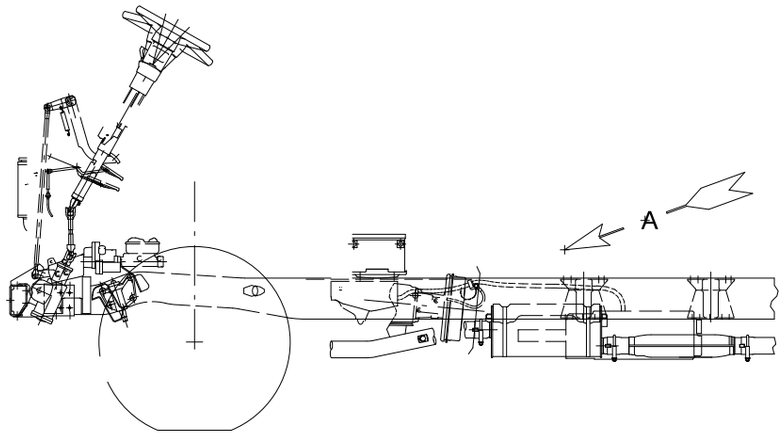
FOR ADDITIONAL INFORMATION SEE CHASSIS DATA PAGE

*NOT FOR USE WITH FS3

P 30032 Auto Apply Park Brake Harness Ground



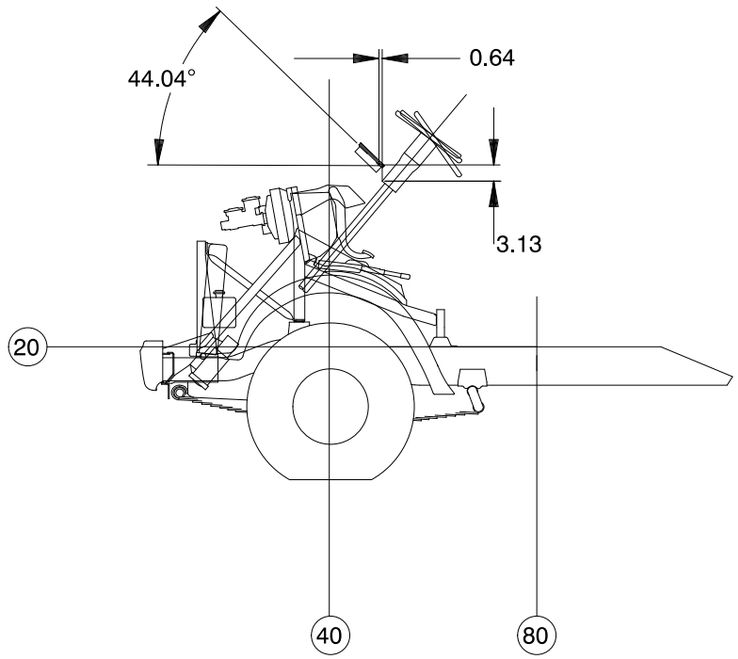
BODY BUILDER TO REAPPLY WITH GMTB 9985086 RUST INHIBITOR OR GMTB ENGINEERING APPROVED EQUIVALENT. (APPROX. .25 CC REQUIRED FOR COMPLETE COVERAGE)



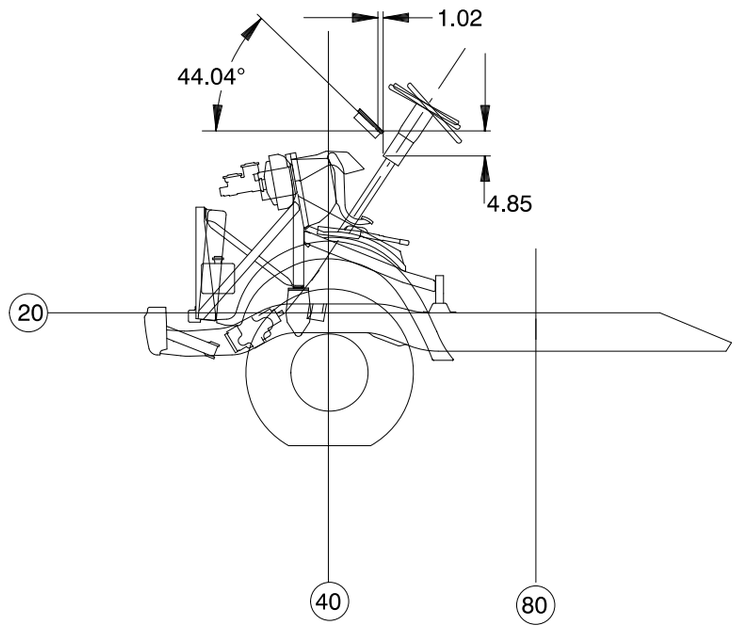
VIEW IN DIRECTION OF ARROW A

NOTE:
THIS VIEW APPLIES FOR THE ELECTRIC AUTO PARK HARNESS GROUNDING PROCEDURE WHEN THE BODY BUILDER REMOVES THE BATTERY NEGATIVE GROUND CABLE.

P 30000 Instrument Cluster Location

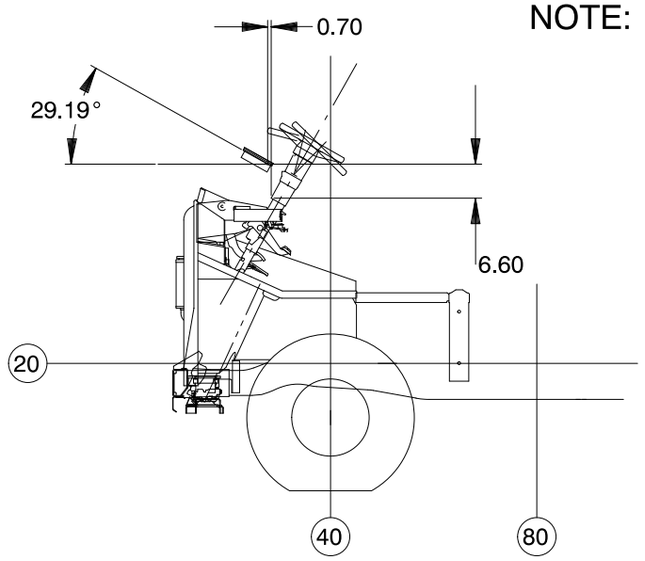


I–BEAM SUSPENSION
P300 42 & FM5/FN6



INDEPENDENT SUSPENSION
P300 42 & FN3/FN5/FN6

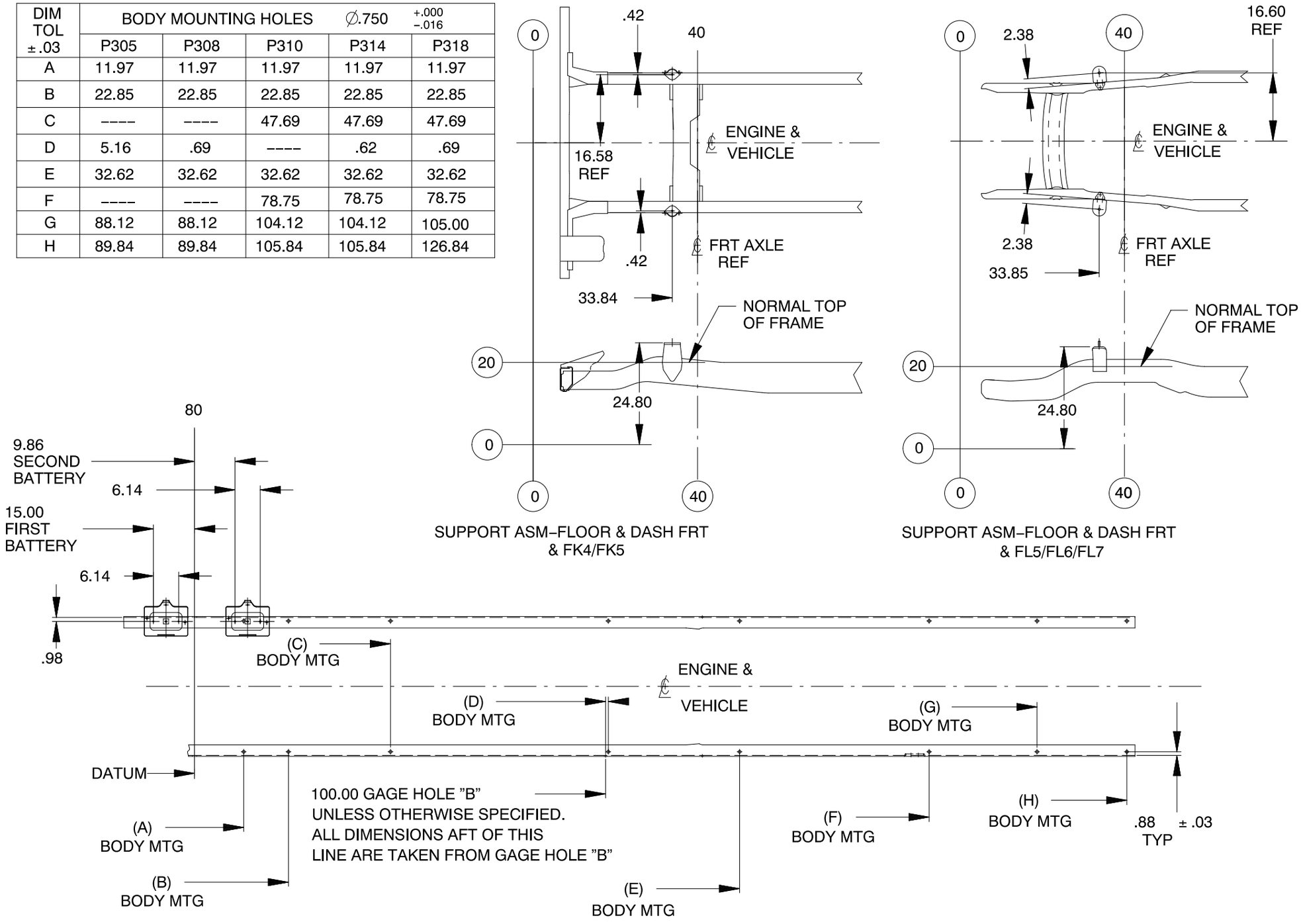
NOTE: ALL INSTRUMENT CLUSTERS ARE CENTERED ABOUT STEERING COLUMN



INDEPENDENT SUSPENSION
P300 32 & FN6/FN8

P 30042 Body Mounting Hole Location–P 30000 Battery Mounting Hole Location

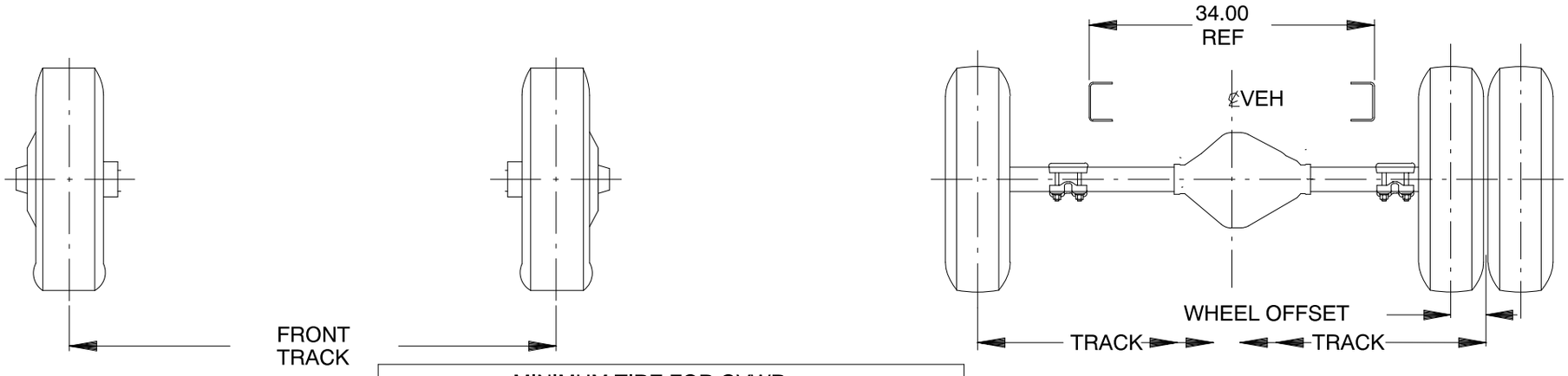
DIM TOL ±.03	BODY MOUNTING HOLES ∅.750 +.000 −.016				
	P305	P308	P310	P314	P318
A	11.97	11.97	11.97	11.97	11.97
B	22.85	22.85	22.85	22.85	22.85
C	----	----	47.69	47.69	47.69
D	5.16	.69	----	.62	.69
E	32.62	32.62	32.62	32.62	32.62
F	----	----	78.75	78.75	78.75
G	88.12	88.12	104.12	104.12	105.00
H	89.84	89.84	105.84	105.84	126.84



FOR ADDITIONAL INFORMATION
SEE CHASSIS DATA PAGE

PICTURE BASED ON P31842

P 30000 Chassis Data

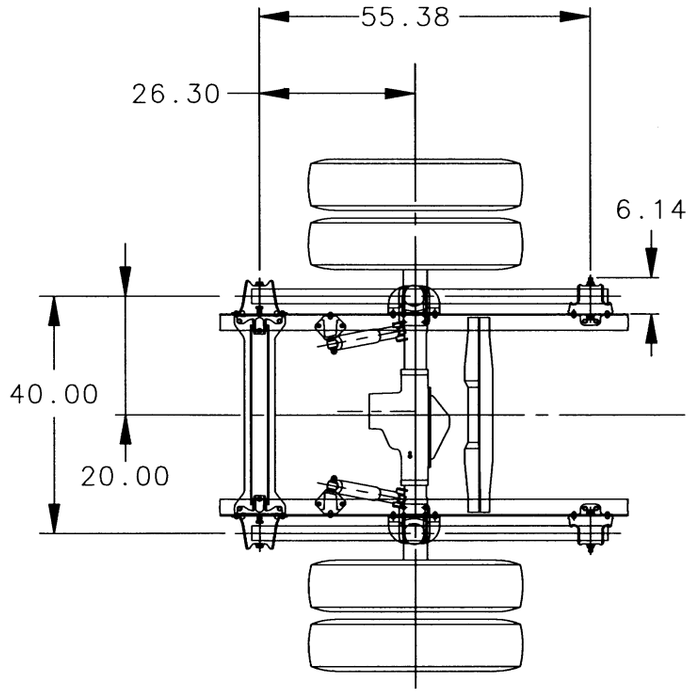


MODEL	GVW	MINIMUM TIRE FOR GVWR: MINIMUM TIRE *	MAX WIDTH	RADIUS	SLR	REAR WHEEL	WHEEL OFFSET	FRONT SUSP	FRONT TRACK	REAR TRACK
P30542 P30842	8600	LT225/75R16E/E	8.98	14.65	13.70	SINGLE	.67	IND	66.44	65.54
P30842 P31042 P31442	9400	LT235/85R16E/E	9.25	15.87	14.61	SINGLE	.67	IND	66.44	65.54
P30842 P30842 P31042 P31132 P31432/42 P31842	10000 THRU 11000 COMMERCIAL 12300 MOTOR HOME	LT215/85R16D/D LT215/85R16D/D 7.50R16LTD/D	8.50 8.50 8.20	15.20 15.20 15.90	14.09 14.09 14.70	DUAL	5.00	42 IND 42 IND&L57/ L31&JF9 32 IND 42 I–BEAM	65.34 65.73 69.70 72.64	63.41
P30842 P31042 P31442 P31842	12000 THRU 14100 COMMERCIAL 14500 SCHOOL BUS	8R19.5E/E 8R19.5E/E 8R19.5E/E	8.40 8.40 8.40	17.05 17.05 17.05	16.00 16.00 16.00	DUAL	5.00	42 IND 42 IND&L57/ L31&JF9 I–BEAM	65.34 65.73 72.64	66.75
P31432 P31832 P31932 P32032	14800	225/70R19.5F	8.90	16.10	14.90	DUAL	5.00	IND	69.70	66.75 ▲ 72.95
P31832 P31932 P32032 P32132	16500	225/70R19.5F	8.90	16.10	14.90	DUAL	5.00	IND	69.70	66.75 ▲ 72.95

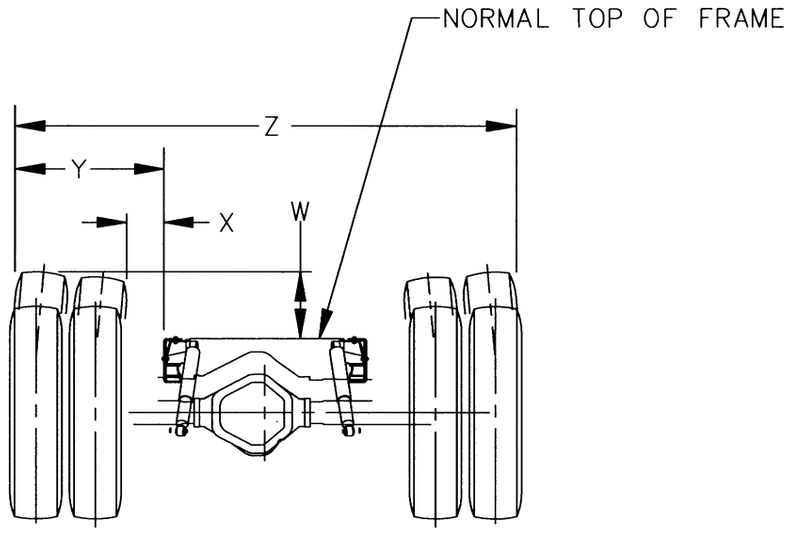
* ALL P MODELS ARE 6.00 RIM WIDTH

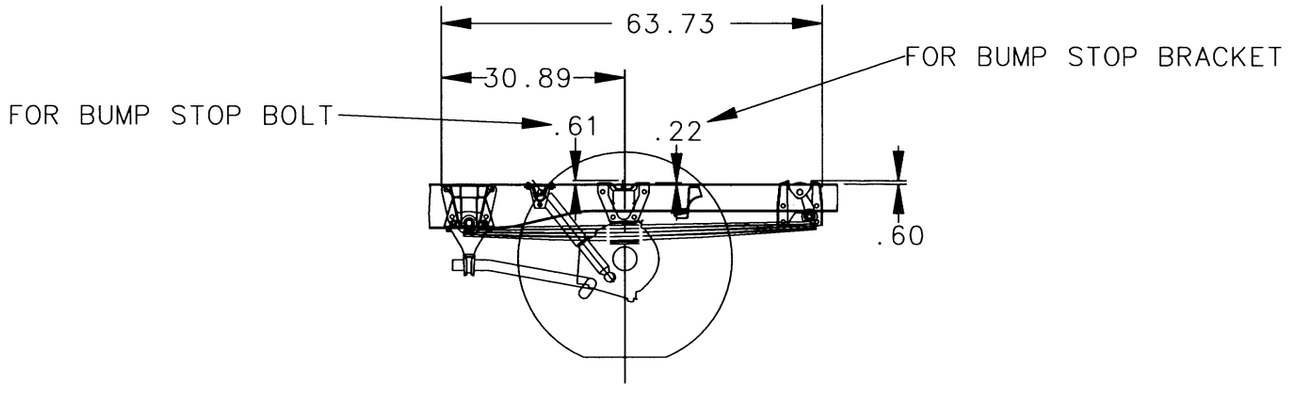
▲ FOR WIDE TRACK AXLE APPLICATION

P 30032 Taperleaf Suspension



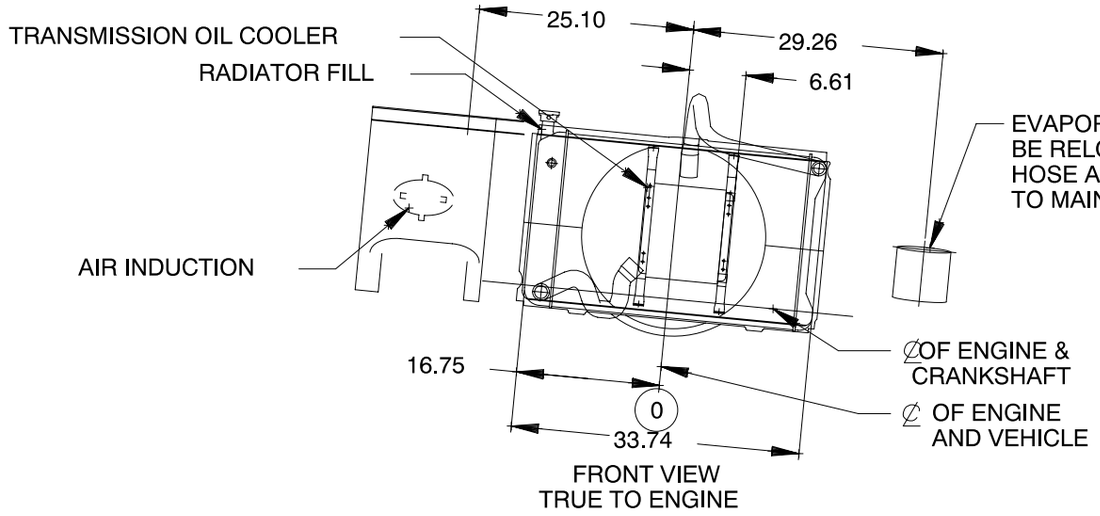
TIRE SIZE	WHEEL	W	X	Y	Z
8.00–19.5	DUAL	10.88	6.39	25.04	85.92
8R–19.5	DUAL	10.10	6.76	24.79	85.31





TAPERLEAF SUSPENSION WITH P30032/52 ONLY

P 30042 Gas Engine, 5.7L V8, Option L31

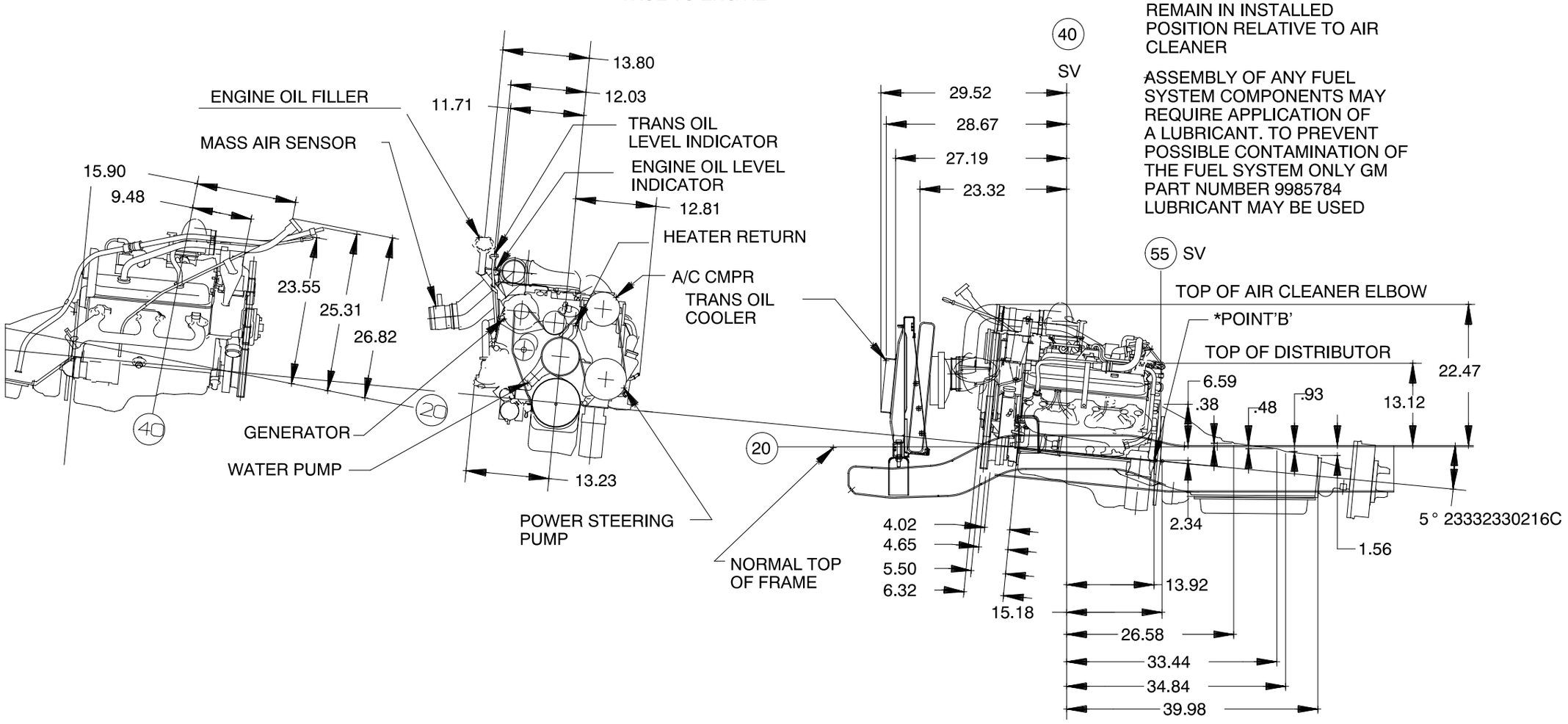


NOTE:
1.25 MINIMUM CLEARANCE REQUIRED TO ANY PART OF ENGINE FOR ENGINE ROLL

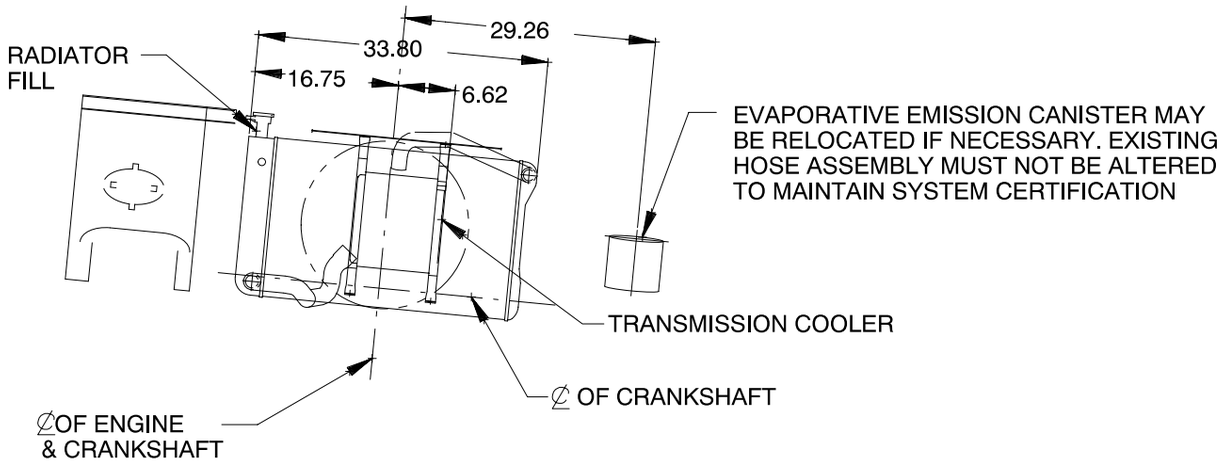
CLEARANCE MUST BE PROVIDED IN VERTICAL MOVEMENT FOR ANY PART ON TOP AREA OF ENGINE FOR SERVICEABILITY

MASS AIR SENSOR MUST REMAIN IN INSTALLED POSITION RELATIVE TO AIR CLEANER

ASSEMBLY OF ANY FUEL SYSTEM COMPONENTS MAY REQUIRE APPLICATION OF A LUBRICANT. TO PREVENT POSSIBLE CONTAMINATION OF THE FUEL SYSTEM ONLY GM PART NUMBER 9985784 LUBRICANT MAY BE USED



P 30042 Gas Engine, 4.3L V6, Option L35



VIEW IN DIRECTION OF ARROW Z

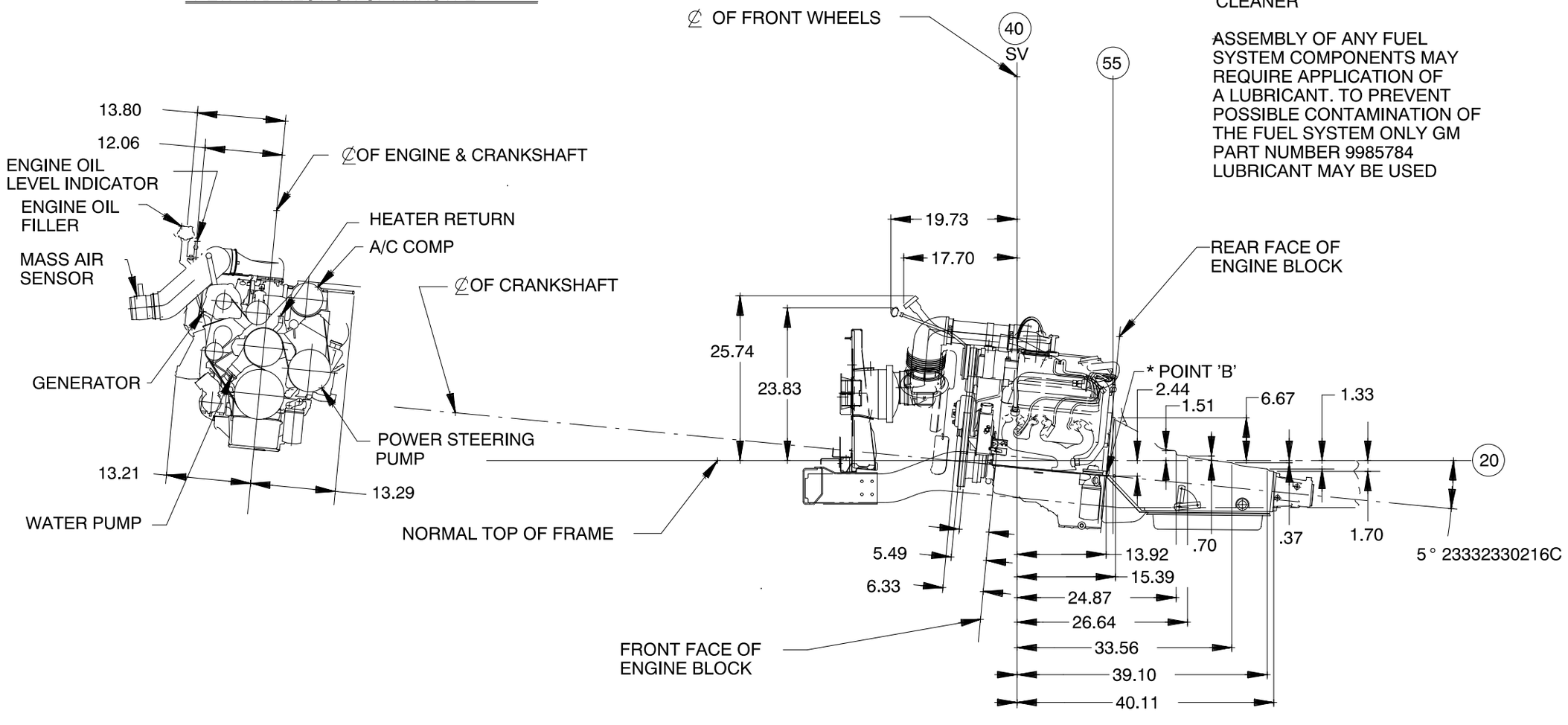
NOTE:
1.25 MINIMUM CLEARANCE REQUIRED TO ANY PART OF ENGINE FOR ENGINE ROLL.

CLEARANCE MUST BE PROVIDED IN VERTICLE MOVEMENT FOR ANY PART ON TOP AERA OF ENGINE FOR SERVICEABILITY.

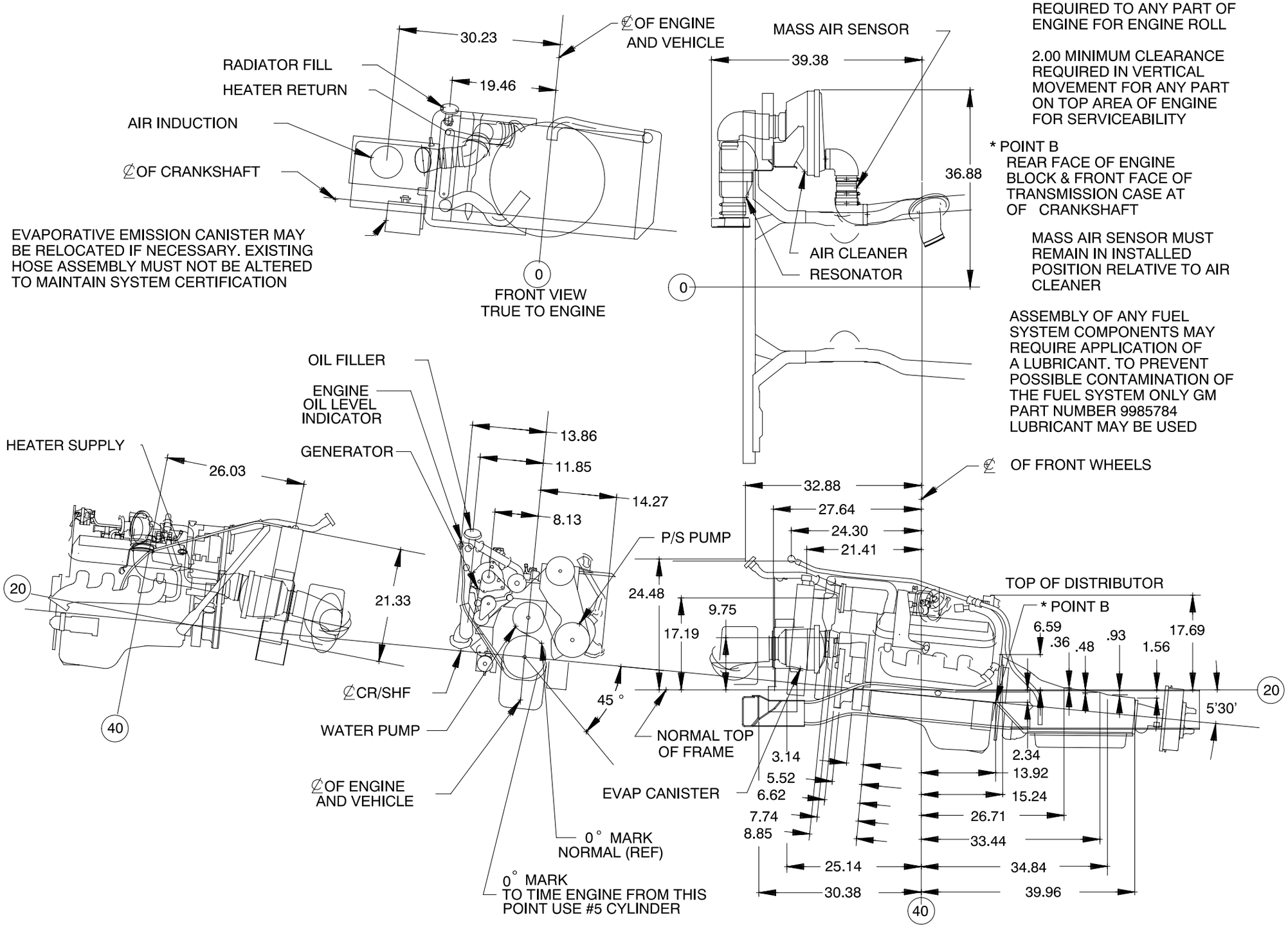
* POINT 'B' REAR FACE OF ENGINE BLOCK & FRONT FACE OF TRANSMISSION CASE AT CENTERLINE OF CRANKSHAFT

MASS AIR SENSOR MUST REMAIN IN INSTALLED POSITION RELATIVE TO AIR CLEANER

ASSEMBLY OF ANY FUEL SYSTEM COMPONENTS MAY REQUIRE APPLICATION OF A LUBRICANT. TO PREVENT POSSIBLE CONTAMINATION OF THE FUEL SYSTEM ONLY GM PART NUMBER 9985784 LUBRICANT MAY BE USED



P 30032 Gas Engine, 7.4L V8, Option L29



NOTE:
1.25 MINIMUM CLEARANCE REQUIRED TO ANY PART OF ENGINE FOR ENGINE ROLL

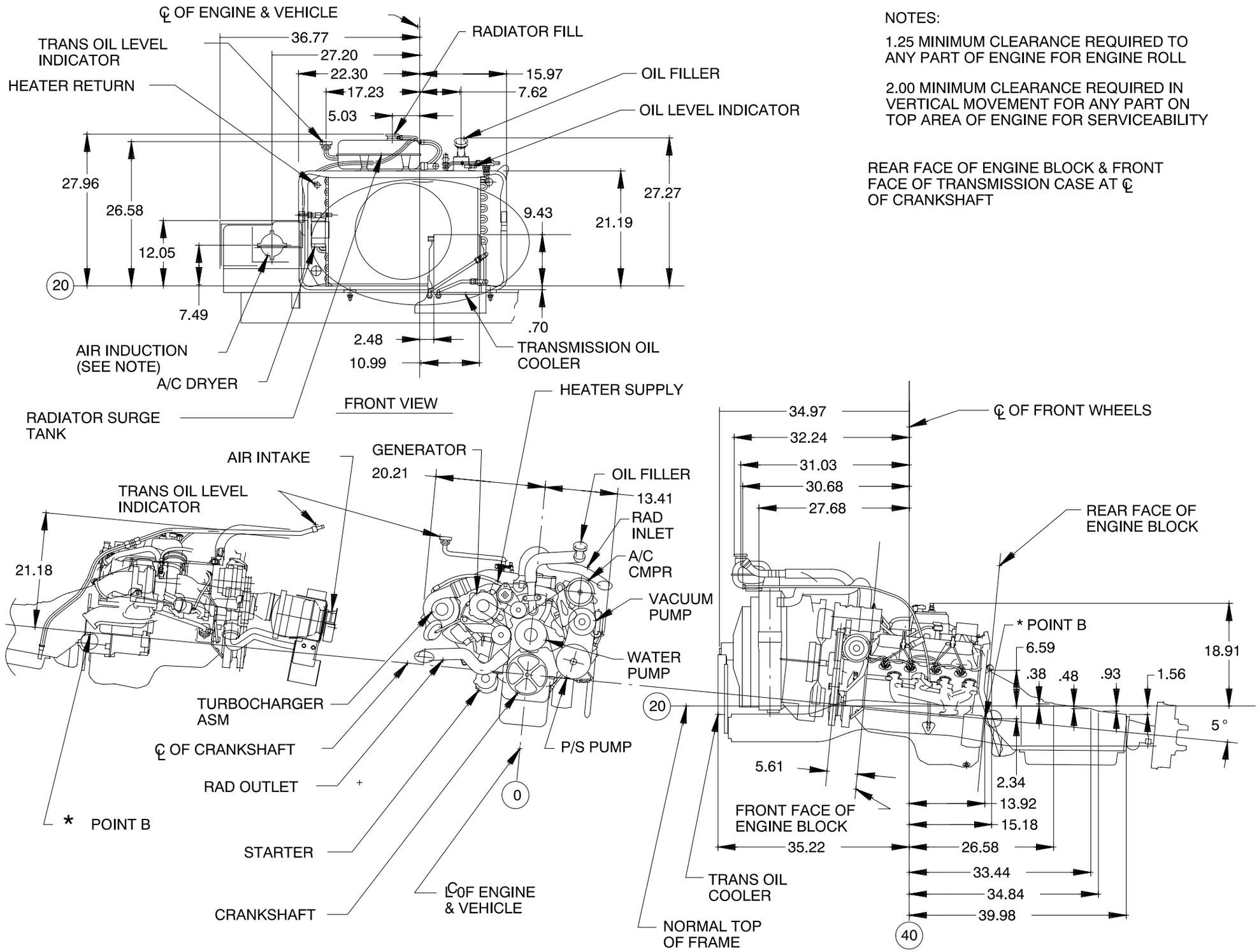
2.00 MINIMUM CLEARANCE REQUIRED IN VERTICAL MOVEMENT FOR ANY PART ON TOP AREA OF ENGINE FOR SERVICEABILITY

* POINT B
REAR FACE OF ENGINE BLOCK & FRONT FACE OF TRANSMISSION CASE AT OF CRANKSHAFT

MASS AIR SENSOR MUST REMAIN IN INSTALLED POSITION RELATIVE TO AIR CLEANER

ASSEMBLY OF ANY FUEL SYSTEM COMPONENTS MAY REQUIRE APPLICATION OF A LUBRICANT. TO PREVENT POSSIBLE CONTAMINATION OF THE FUEL SYSTEM ONLY GM PART NUMBER 9985784 LUBRICANT MAY BE USED

P 30032 Diesel Engine, 6.5L Turbo Ho, Option L65



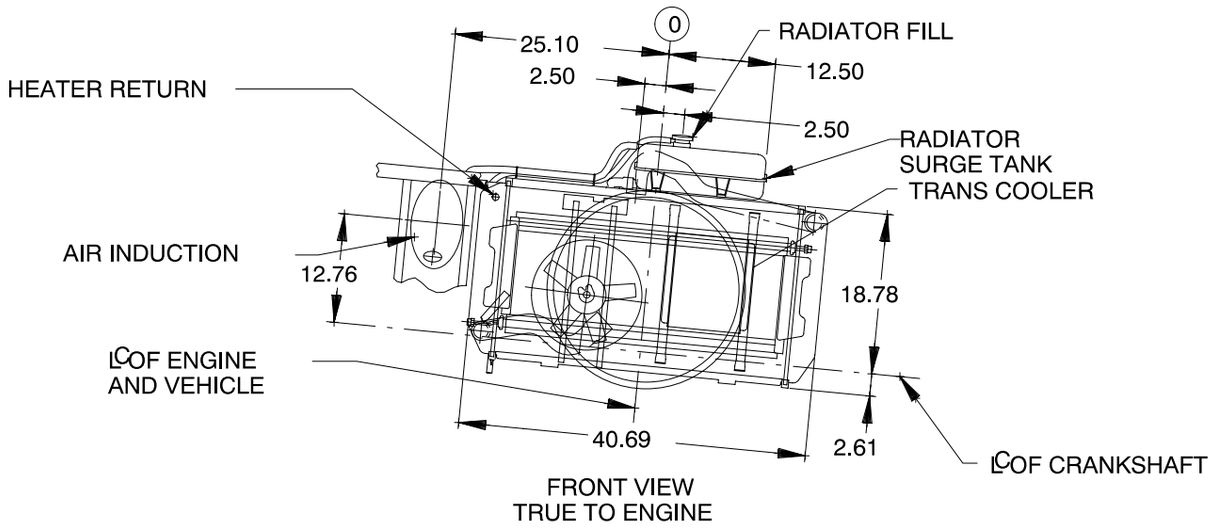
NOTES:

1.25 MINIMUM CLEARANCE REQUIRED TO ANY PART OF ENGINE FOR ENGINE ROLL

2.00 MINIMUM CLEARANCE REQUIRED IN VERTICAL MOVEMENT FOR ANY PART ON TOP AREA OF ENGINE FOR SERVICEABILITY

REAR FACE OF ENGINE BLOCK & FRONT FACE OF TRANSMISSION CASE AT ℄ OF CRANKSHAFT

P 30042 Diesel Engine, 6.5L HO, Option L57



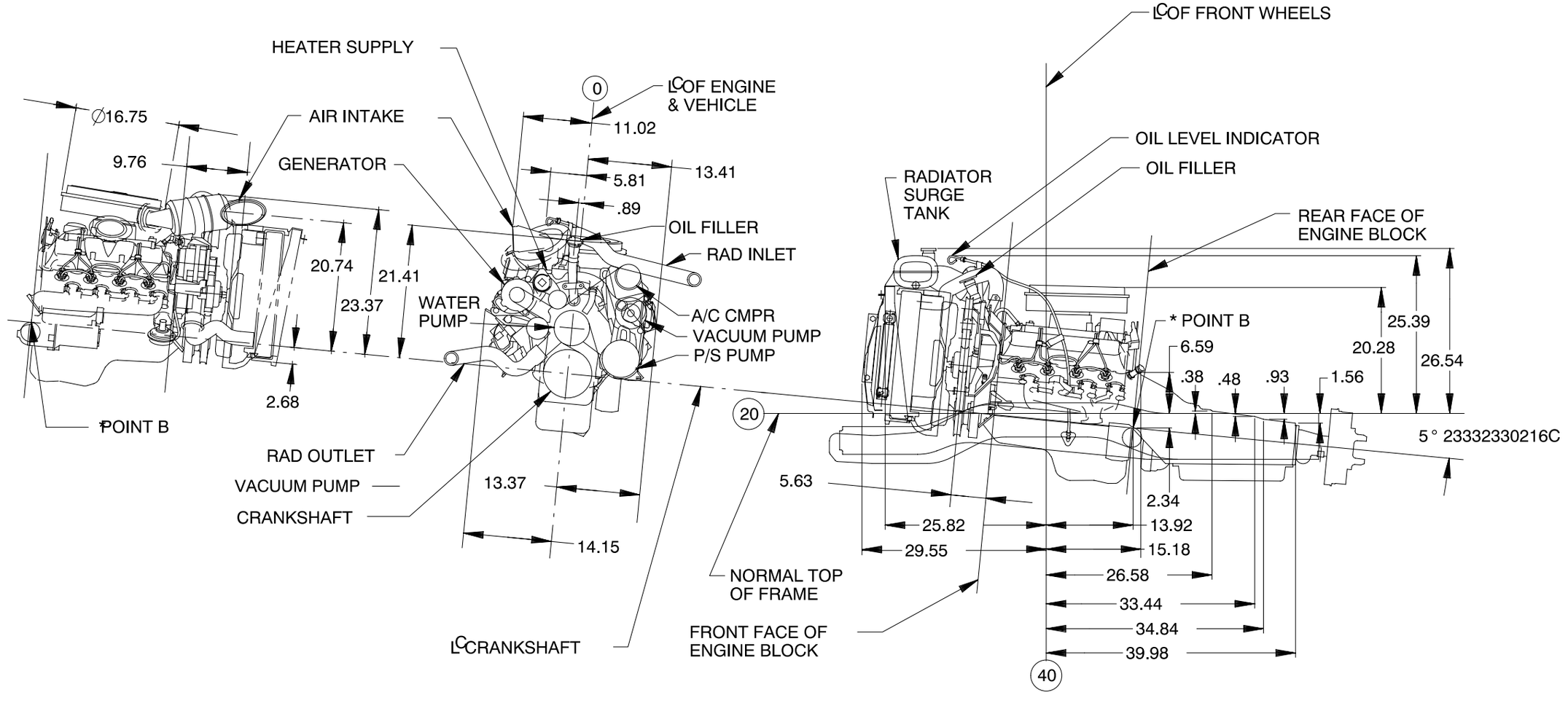
FRONT VIEW
TRUE TO ENGINE

NOTE:

1.25 MINIMUM CLEARANCE REQUIRED TO ANY PART OF ENGINE FOR ENGINE ROLL

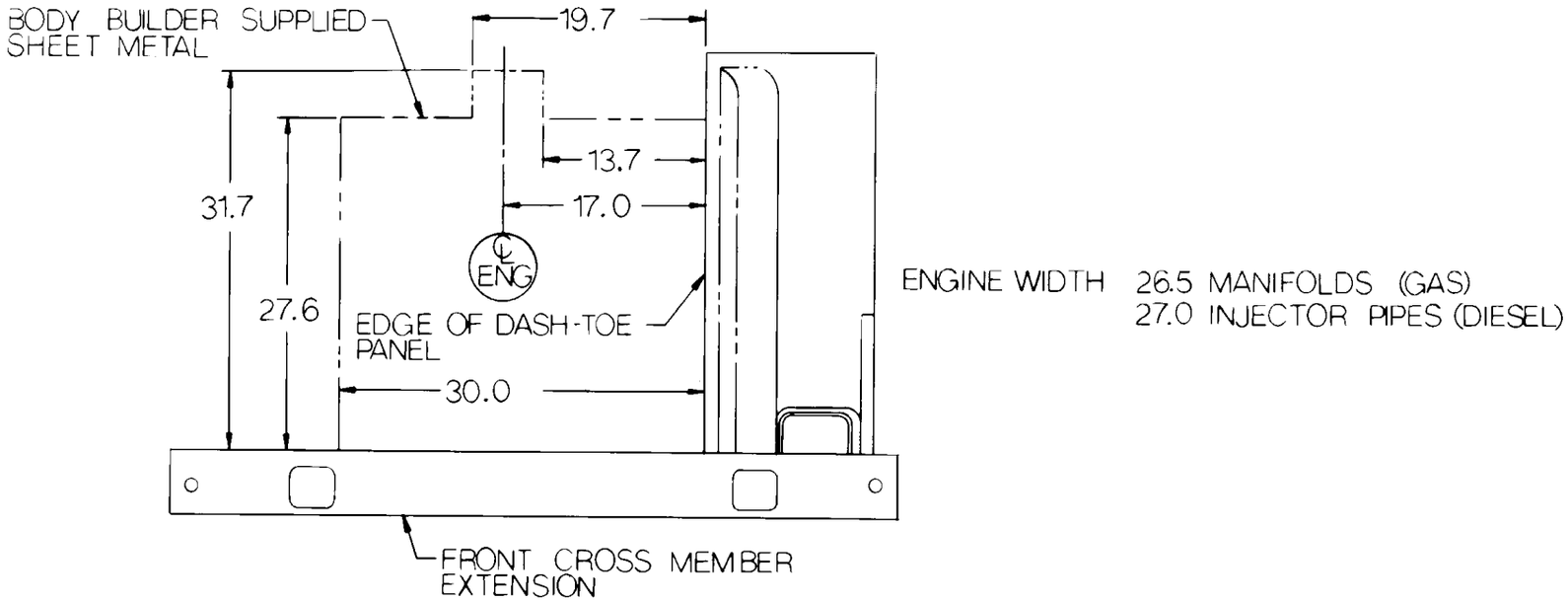
2.00 MINIMUM CLEARANCE REQUIRED IN VERTICAL MOVEMENT FOR ANY PART ON TOP AREA OF ENGINE FOR SERVICEABILITY

*POINT B
REAR FACE OF ENGINE BLOCK & FRONT FACE OF TRANSMISSION CASE AT ℄ OF CRANKSHAFT



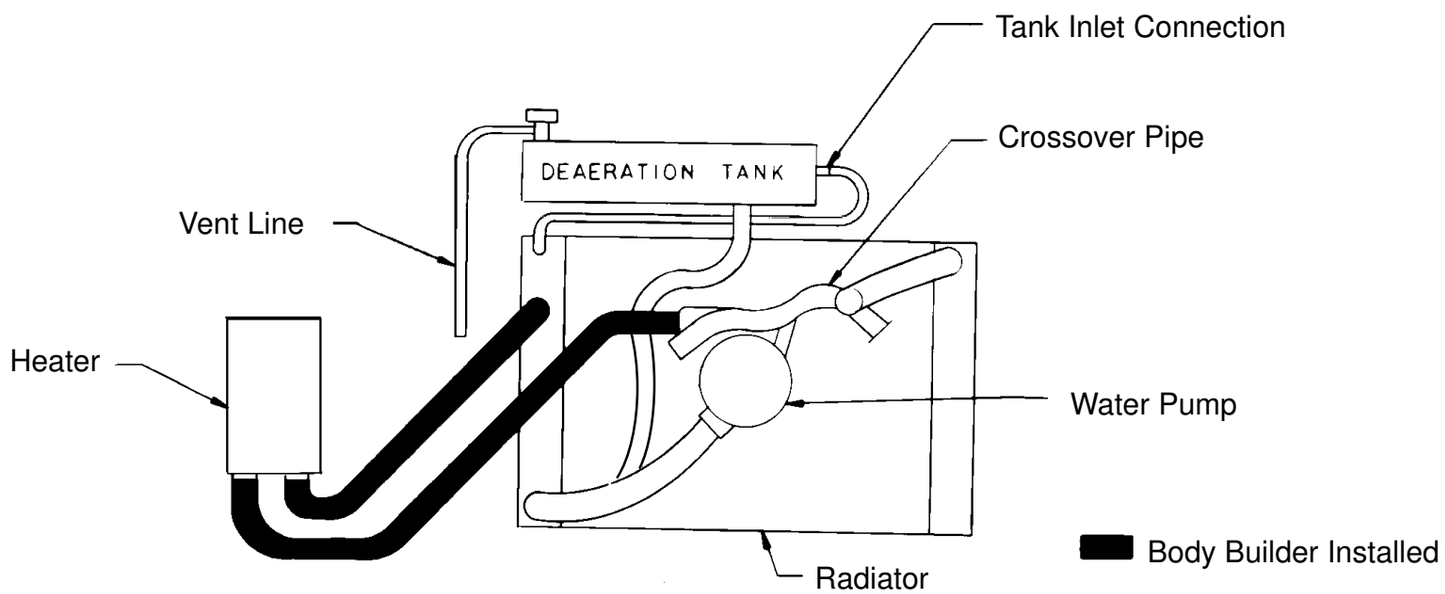
P 300(32/42) Engine Removal Space Requirements and Deaeration Cooling System

Engine Removal Space Requirements

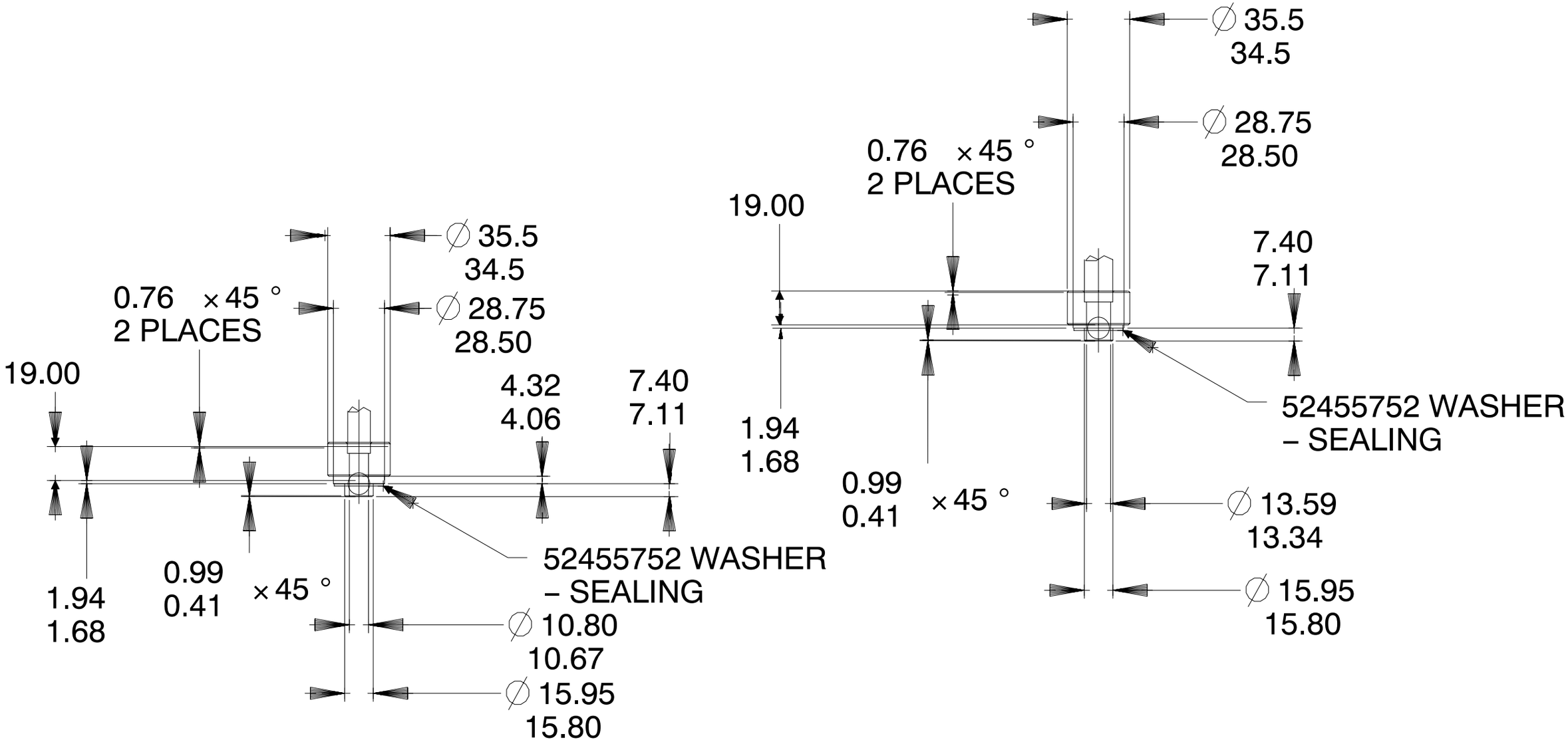


ENGINE WIDTH 26.5 MANIFOLDS (GAS)
27.0 INJECTOR PIPES (DIESEL)

Deaeration Cooling System – Diesel



P 30042 Air Conditioning Fittings

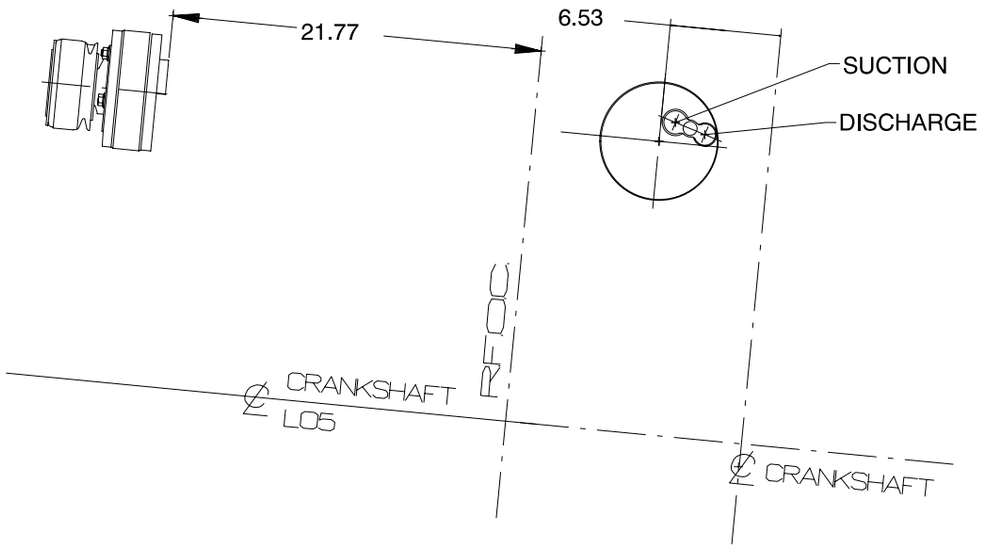


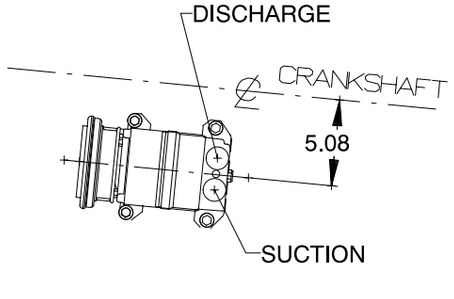
ALL SEALING SURFACES MUST BE FREE FROM SCRATCHES AND NICKS

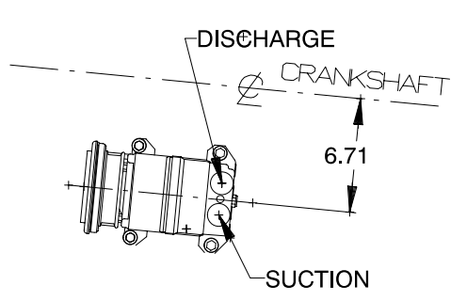
DISCHARGE FITTING
(L29,L31,L35,L57,L65)

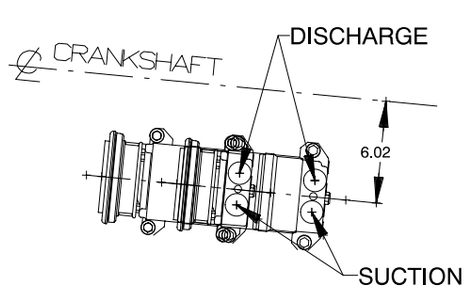
SUCTION FITTING
(L29,L31,L35,L57,L65)
(SUPPLIED BY BODY BUILDER)

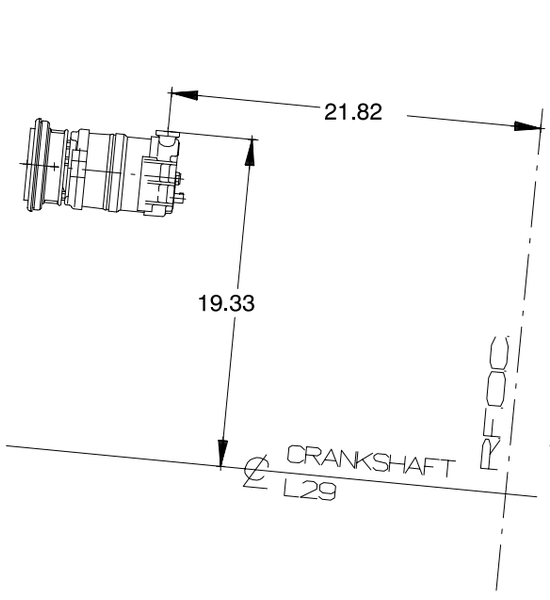
P 30042 Air Conditioning Compressor Locations

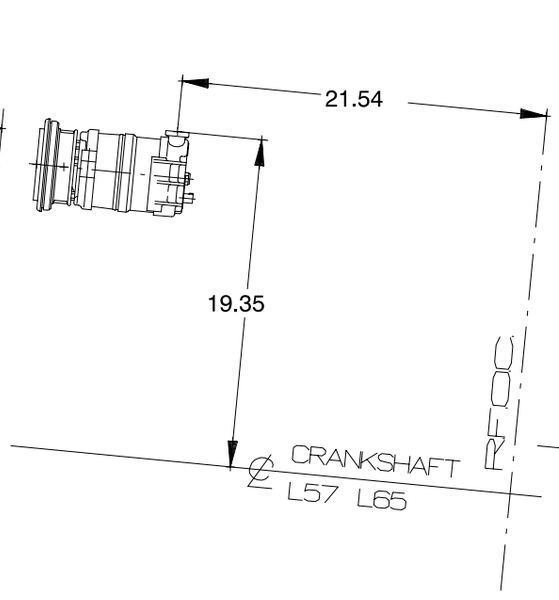


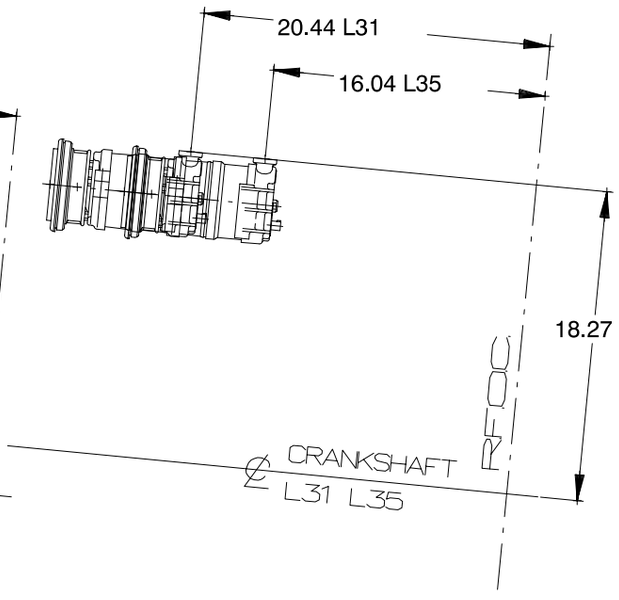




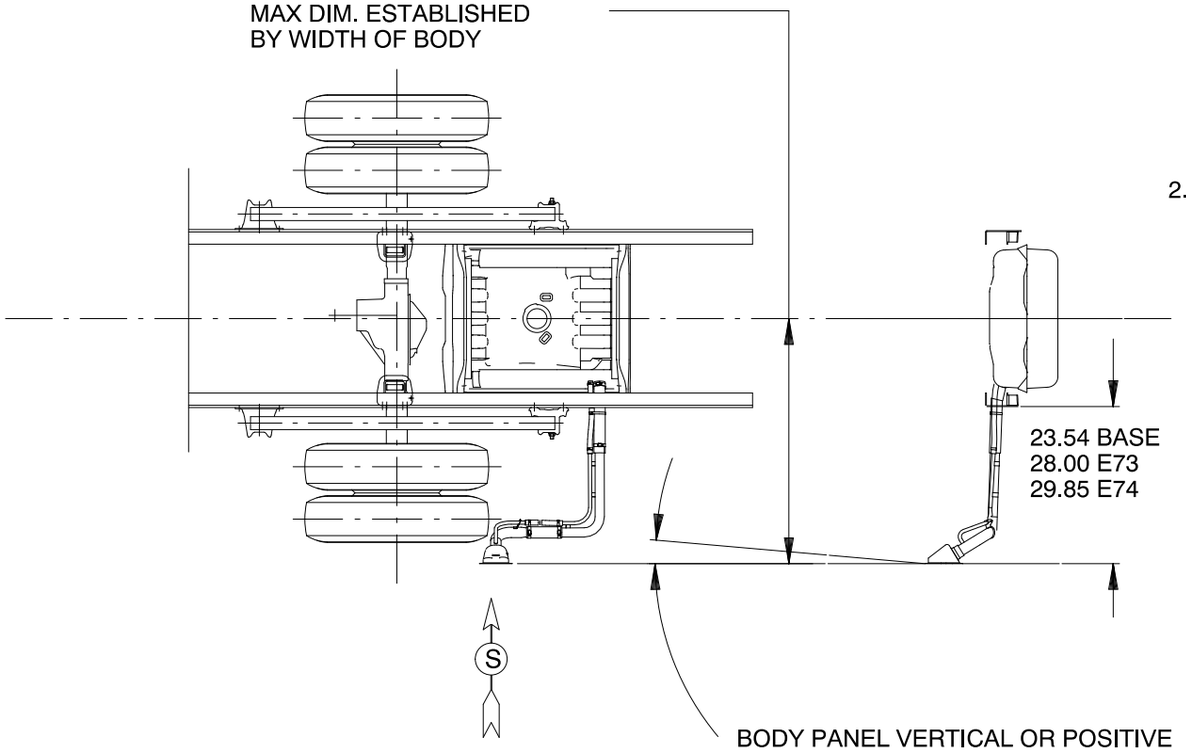




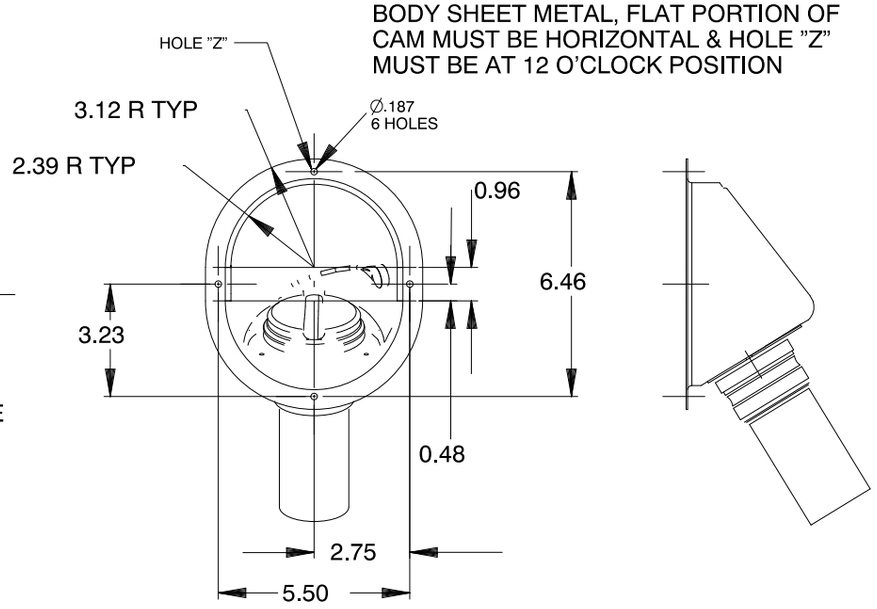




P 300(32/42) Fuel Filler Neck

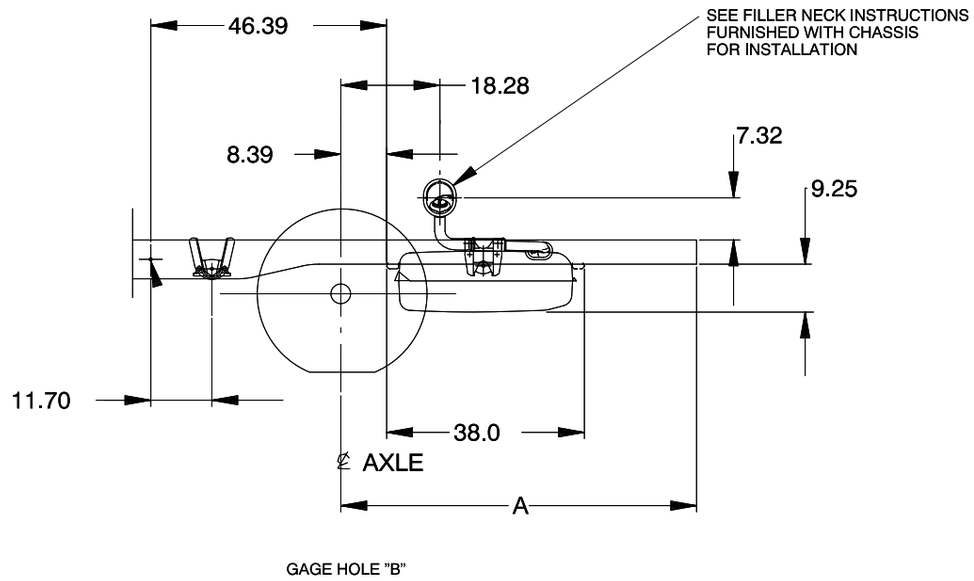

MAX DIM. ESTABLISHED
BY WIDTH OF BODY
23.54 BASE
28.00 E73
29.85 E74
S
BODY PANEL VERTICAL OR POSITIVE ANGLE RELATIVE TO GROUND LINE AS REQUIRED TO SATISFY CALIFORNIA VAPOR RECOVERY REQUIREMENTS

NOTE:
AFTER FILLER NECK IS ASSEMBLED TO BODY SHEET METAL, FLAT PORTION OF CAM MUST BE HORIZONTAL & HOLE "Z" MUST BE AT 12 O'CLOCK POSITION



VIEW IN DIRECTION OF ARROW "S"

FILLER NECK OPENING FOR E32 / E33 / B3D / B3M
SEE GENERAL ARRANGEMENT DRAWING FOR
FILLER NECK LOCATION FOR B3D / B3M



MODEL	DIM "A"
P311 32	63.82
P314 32	67.38
P318 32	106.00
P319 32	106.00
P320 32	106.00
P321 32	106.00
P308 42	53.82
P310 42	69.82
P314 42	69.82
P318 42	90.82

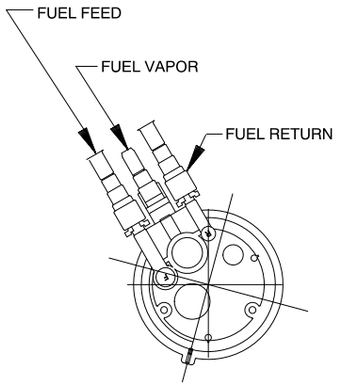
P 30000 Fuel Tank Arrangement

REMOVE FROM THE PERMANENT TANK THE SNAP RING AND SHIPPING PROTECTOR

INSTALL O–RING AND SENDER ASM INTO FUEL TANK. LINE UP TAB ON FUEL SENDER WITH SLOT IN TANK. SECURE THE PARTS WITH THE SNAP RING.

REMOVE THE U–SHAPED STEEL TUBE FROM THE REAR FUEL LINES AND DISCARD PIPE.

CONNECT VAPOR LINE, FUEL FEED AND FUEL RETURN LINES TO FUEL SENDER AS SHOWN IN VIEW ”B”



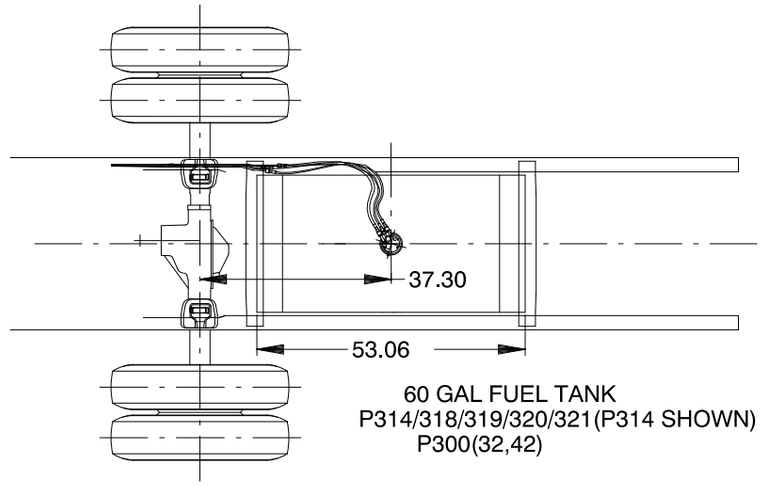
VIEW ”B”

TANK WITH FUEL SENDER/PUMP INSTALLED IS TO BE PRESSURE CHECKED BY BODY BUILDER AT A PRESSURE NOT GREATER THAN 3 PSIG. THIS CHECK MUST OCCUR PRIOR TO REMOVAL OF PLUGS FOR VAPOR VENT OR AUXILIARY FUEL PICK UP SYSTEM

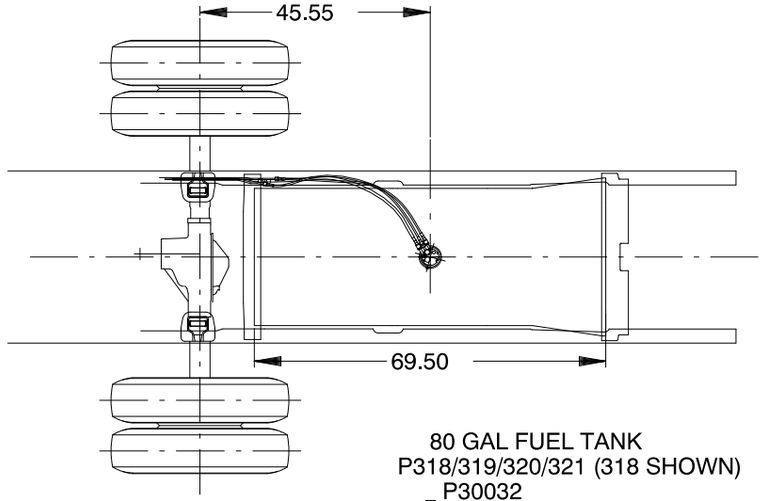
REMOVE VENT SHIPPING PLUG WITH TAG
INSTALL 15676369 STEEL PLUG
TORQUE TO 19–27 Nm

80 GALLON TANK RPO NJ9

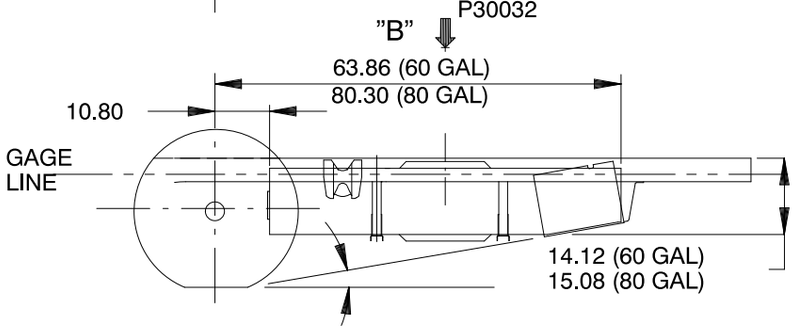
THE 80 GALLON TANK WILL BE AVAILABLE IN A CONFIGURATION THAT ALLOWS IT TO BE FUELED FROM EITHER THE LEFT OR THE RIGHT SIDE OF THE VEHICLE. TO ACCOMODATE THIS FEATURE, THE TANK HAS FILL AND VENT TUBES ON BOTH SIDES, THE BODY BUILDER IS TO CHOOSE WHICH SIDE HE WILL BE USING FOR FUEL FILL, AND REMOVE, AND DISCARD, ONLY THE CAPS TO BE REPLACED, BY THE FUEL FILL HOSES THAT ARE SHIPPED LOOSE. ONE SET OF CAPS SHIPPED ON THE FUEL TANK WILL REMAIN IN PLACE ON THE COMPLETED VEHICLE.



60 GAL FUEL TANK
P314/318/319/320/321(P314 SHOWN)
P300(32,42)

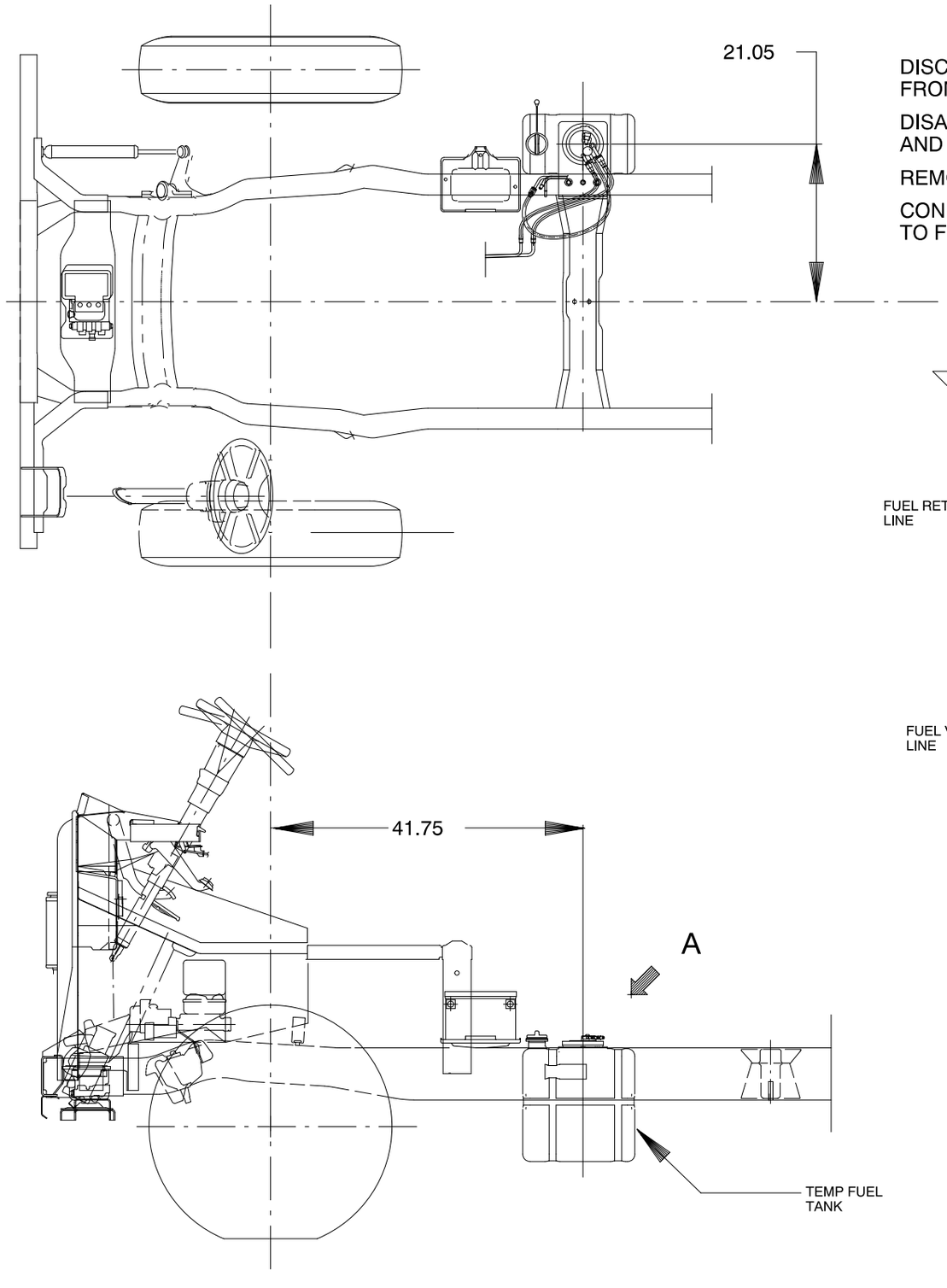


80 GAL FUEL TANK
P318/319/320/321 (318 SHOWN)
P30032



FUEL TANK REAR SHIELDS PROVIDE PROTECTION FOR THE DEPARTURE ANGLE SHOWN ABOVE, ANY ALTERATION TO THESE SHIELDS REQUIRES THAT AN EQUIVALENT ANGLE AND DEPTH OF PROTECTION BE PROVIDED BY THE COMPLETED VEHICLE

P 30000 Temporary Fuel Tank Arrangement

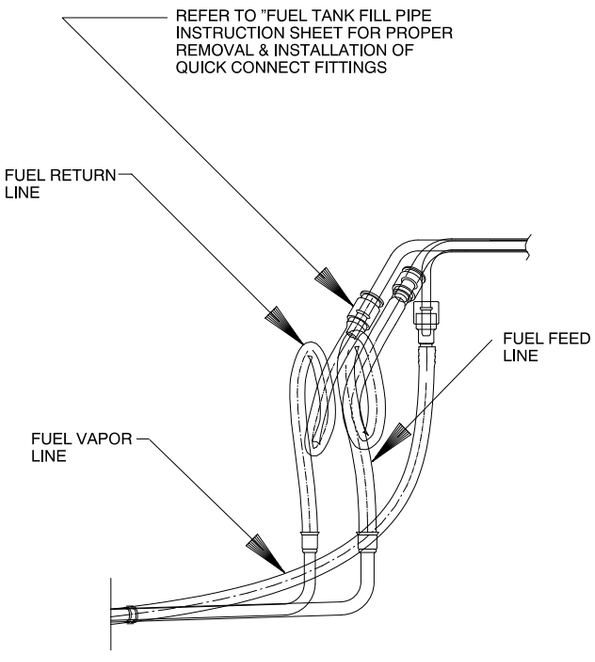


DISCONNECT ALL FUEL LINES AND THE ELECTRICAL CONNECTOR FROM THE TEMPORARY TANK FUEL SENDER ASSEMBLY

DISASSEMBLE SNAP RING & REMOVE FUEL SENDER ASM AND O–RING & FUEL CAP

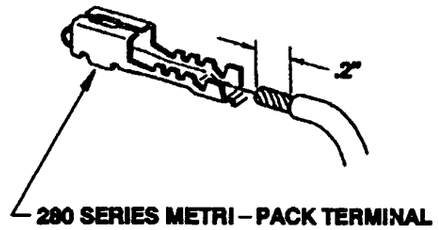
REMOVE AND DISCARD TEMPORARY FUEL TANK.

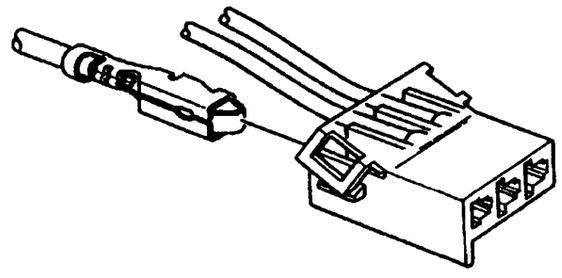
CONNECT VAPOR LINE, FUEL FEED AND FUEL RETURN LINES TO FRAME RAIL LOCATED PIPES AS SHOWN IN VIEW “A”

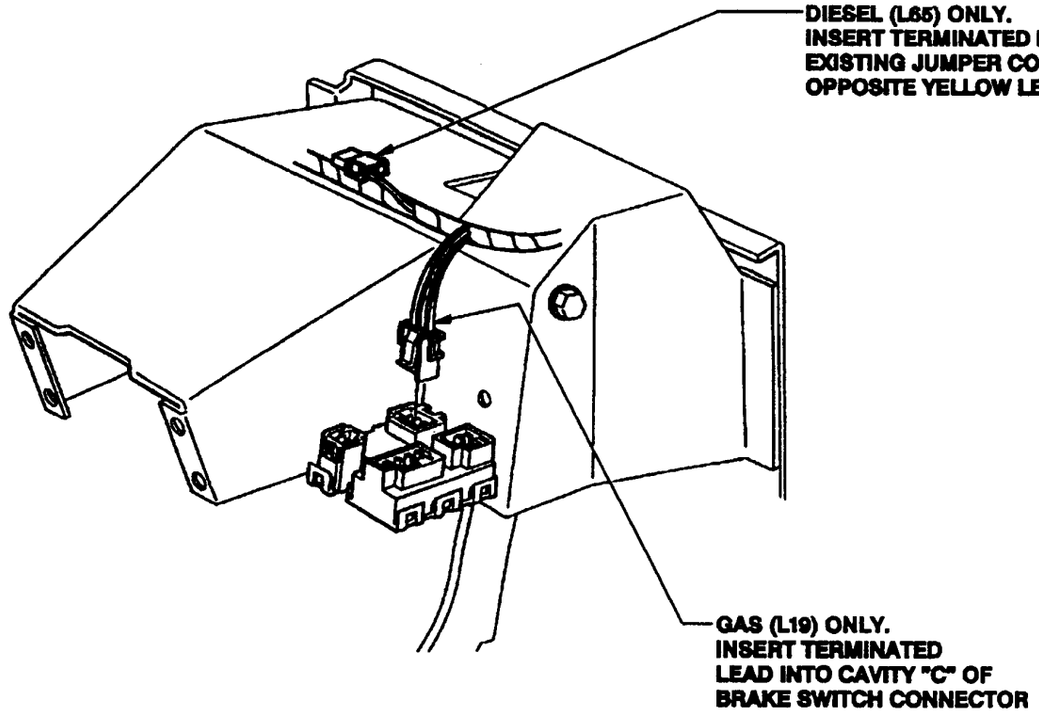

REFER TO "FUEL TANK FILL PIPE INSTRUCTION SHEET FOR PROPER REMOVAL & INSTALLATION OF QUICK CONNECT FITTINGS
FUEL RETURN LINE
FUEL FEED LINE
FUEL VAPOR LINE

VIEW “A”

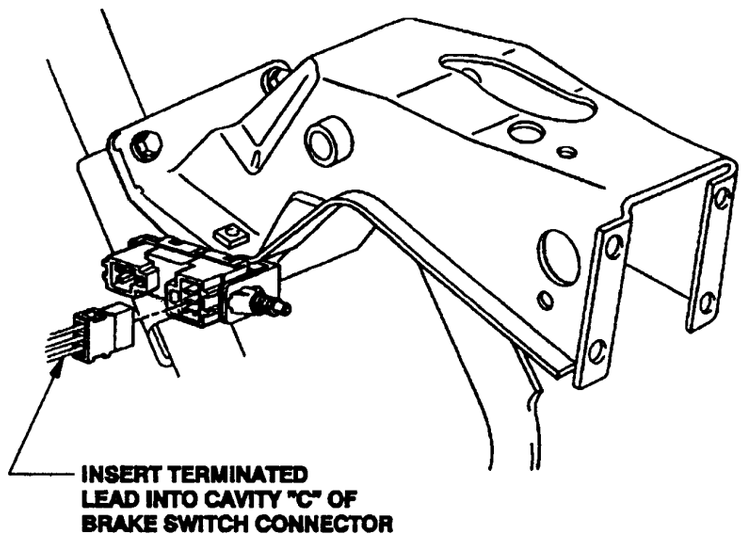
P 30000 Center High Mounted Stop Lamp (CHMSL)







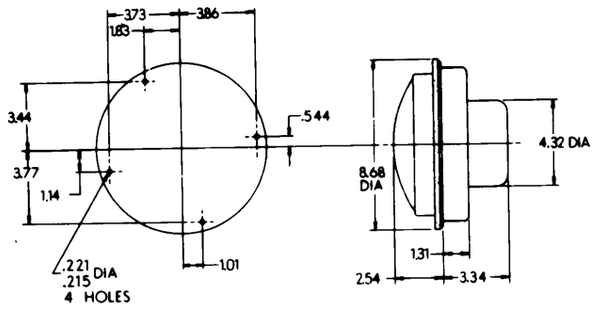
MOTOR HOME BRAKE SWITCH MTG.



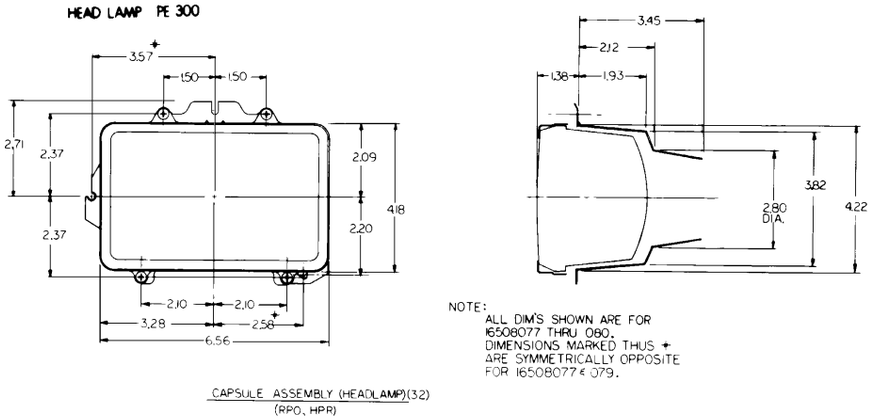
COMMERICAL BRAKE SWITCH MOUNTING

P 300(32/42) Lamp Mounting

P 30032



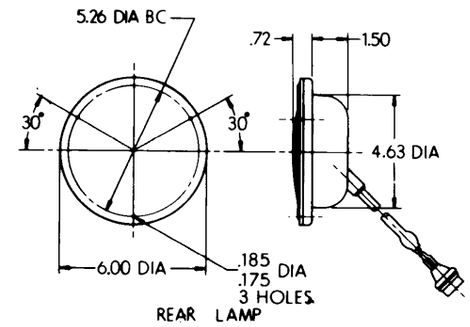
HEAD LAMP PE 300



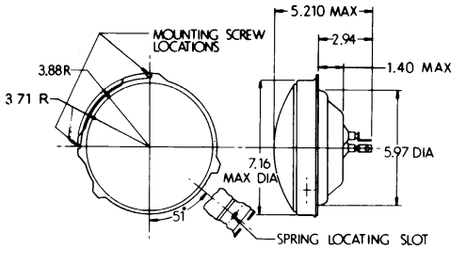
NOTE:
ALL DIM'S SHOWN ARE FOR 16508077 THRU 080.
DIMENSIONS MARKED THUS + ARE SYMMETRICALLY OPPOSITE FOR 16508077 & 079.

CAPSULE ASSEMBLY (HEADLAMP)(32)
(RPO, HPR)

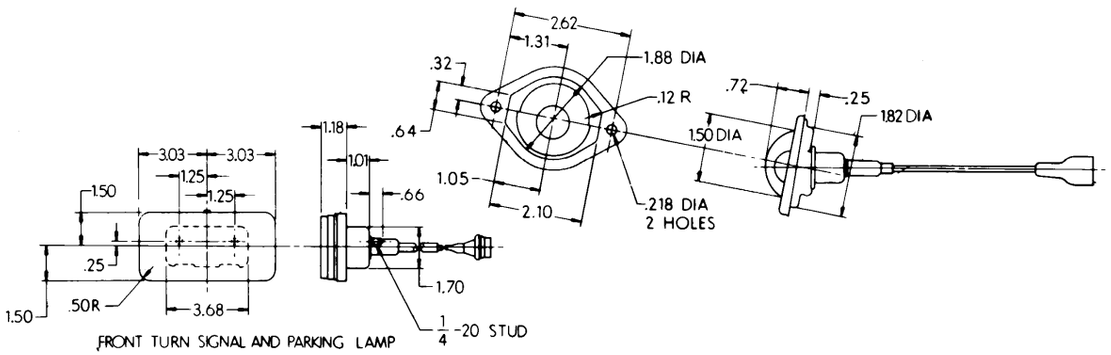
P 30042



REAR LAMP

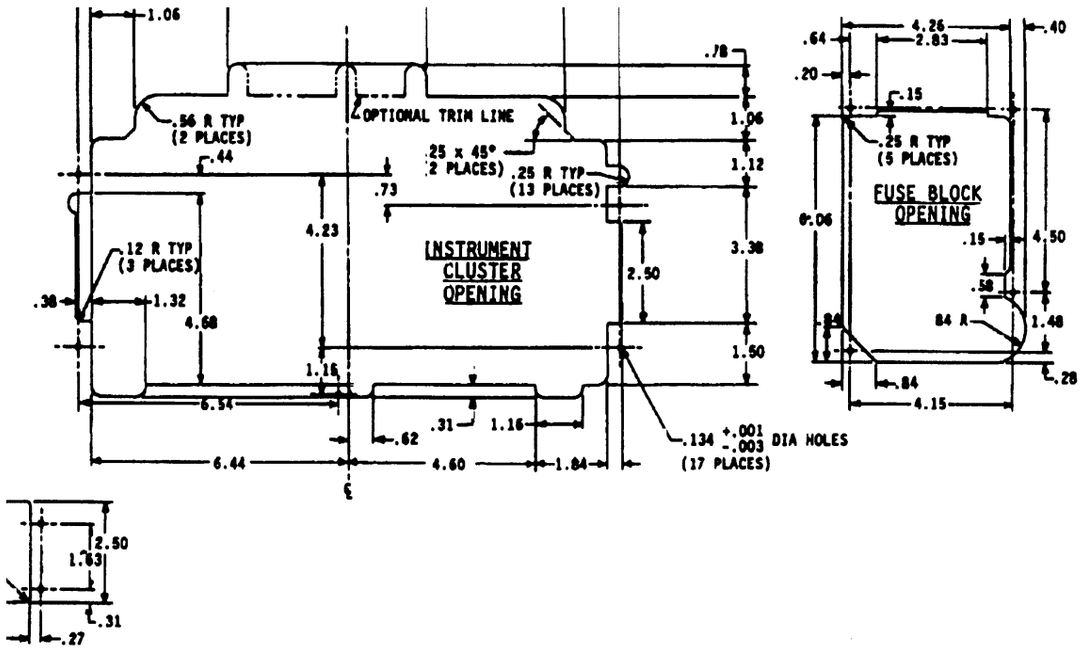


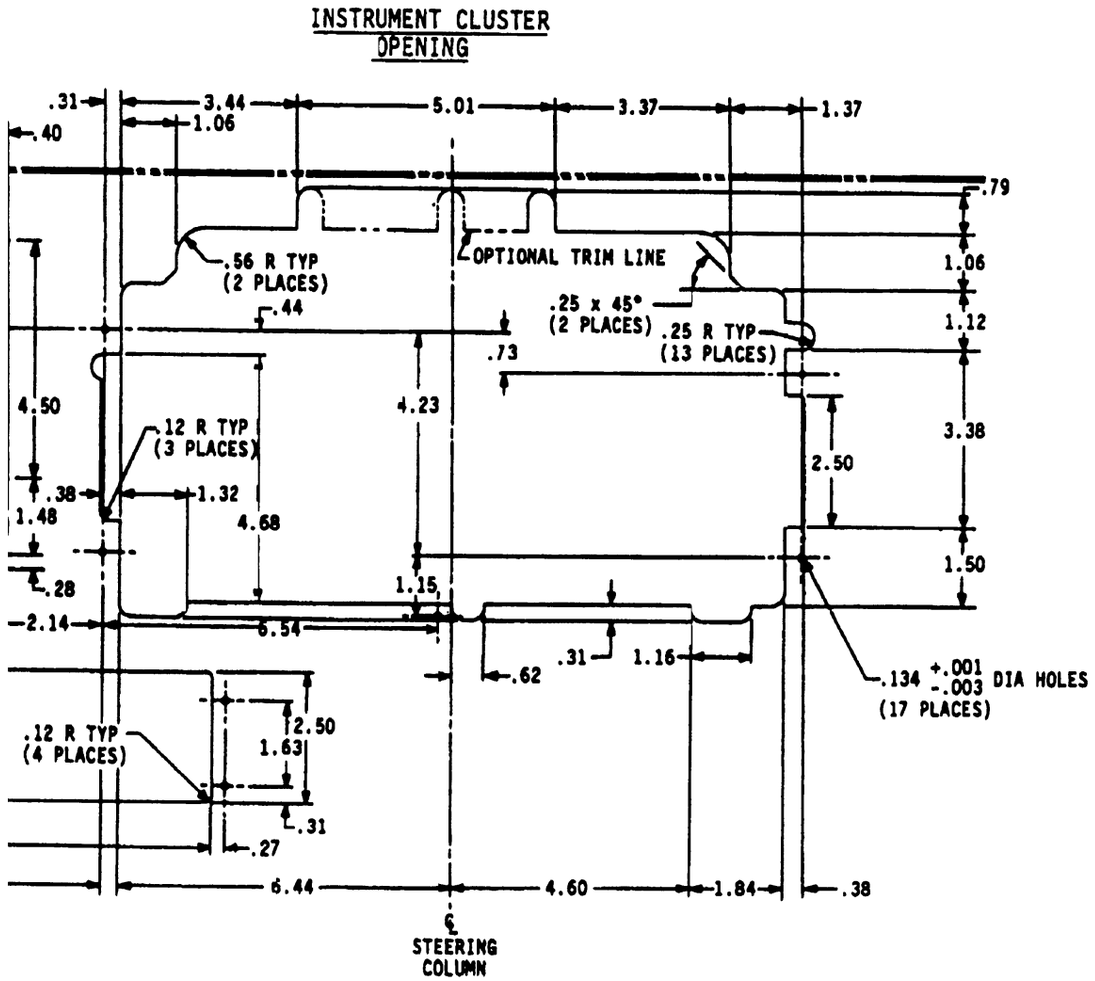
HEAD LAMP



FRONT TURN SIGNAL AND PARKING LAMP

P 300(32/42) Instrument Panel, Cut Out





Ordering Information

Electrical diagrams are available from Chevrolet and GMC through service publications. They have contracted the following companies to handle the ordering and shipping of the manuals.

Helm Inc.
P.O. Box 07130
Detroit, Michigan 48207

1 (313) 865-5000 for information and inquiries
1 (800) 782-4356 for credit card orders

Routine orders will be shipped within 10 days of receipt. Rush orders will be accommodated for an additional charge.

Order forms are available upon request and orders can be paid by check or money order, made payable to the mentioned companies. Credit Card orders can be made by phone on the listed toll free phone numbers.